

In This Issue—*The Profit Line in Maintenance*

# MOTOR AGE

Vol. XLIII  
Number 16

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, APRIL 19, 1923

Thirty-five Cents a Copy  
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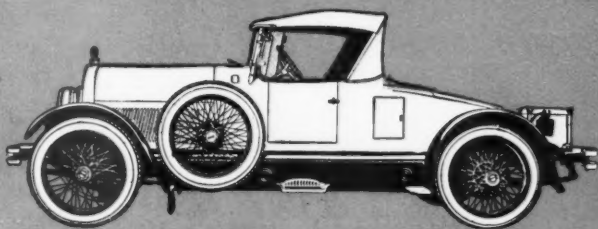
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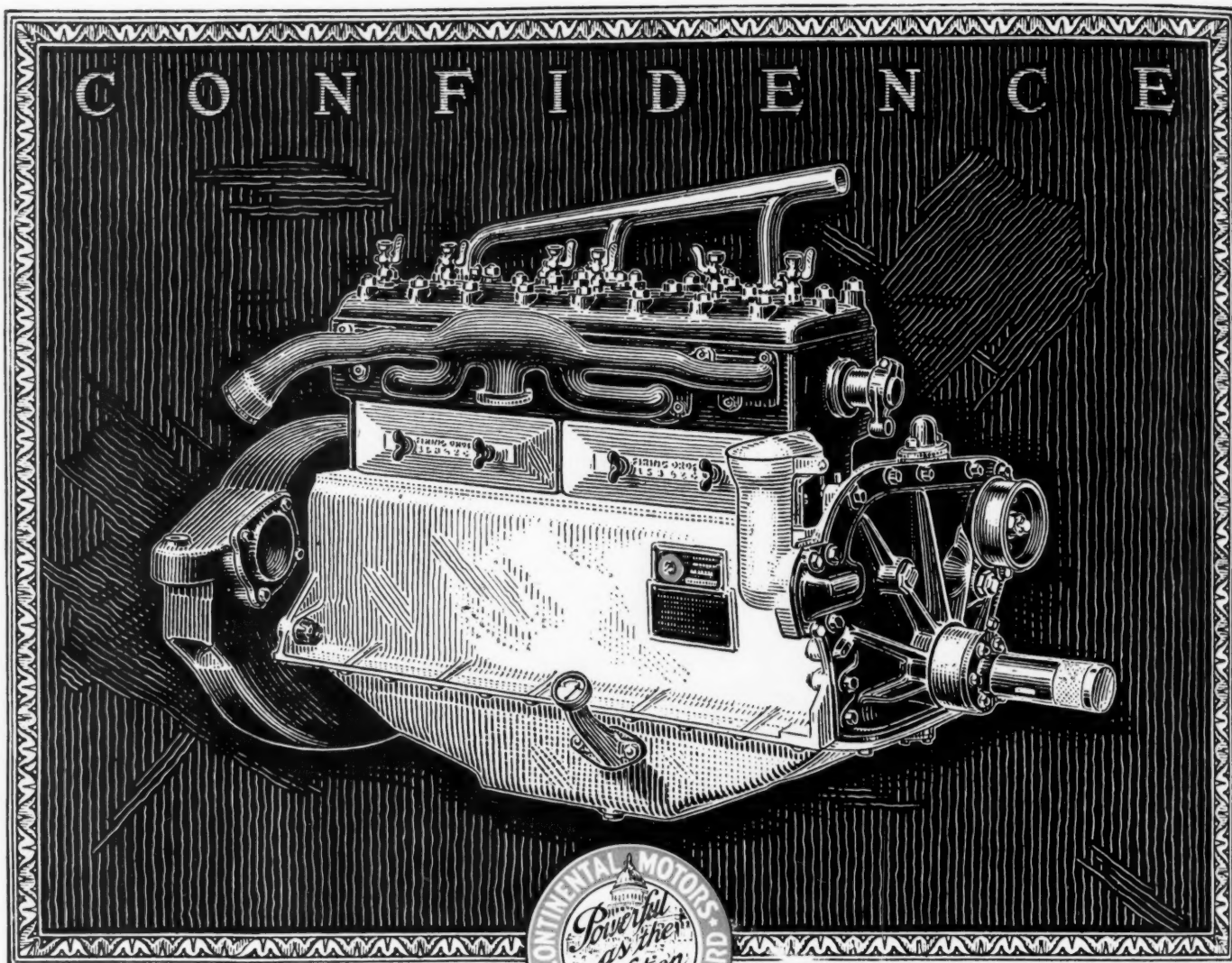
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1923	Shipments
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February	2,067,273
March	2,273,714
April	Over 2,500,000

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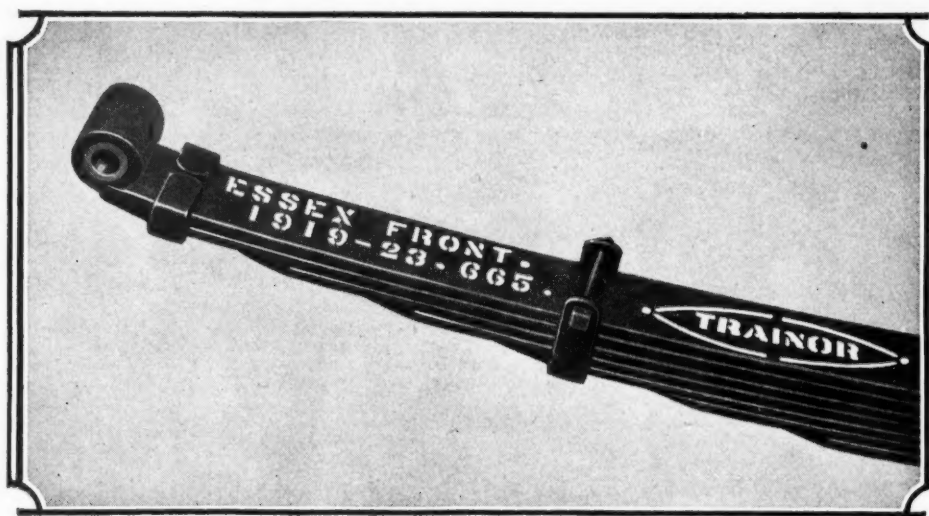
1923 APRIL 1923  
Sun Mon Tue Wed Thu Fri Sat  
over 2,500,000  
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1923 MARCH 1923  
Sun Mon Tue Wed Thu Fri Sat  
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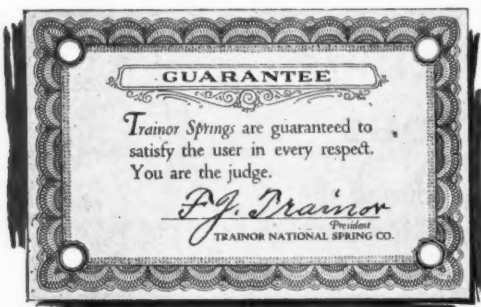
1923 JANUARY 1923  
Sun Mon Tue Wed Thu Fri Sat  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

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TRAINOR NATIONAL SPRING COMPANY

NEW CASTLE, IND.





# MOTOR AGE

Published Every Thursday by  
**THE CLASS JOURNAL COMPANY**  
 MALLERS BUILDING  
 59 East Madison Street, CHICAGO

Vol. XLIII Chicago, April 19, 1923 No. 16

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United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Subscriptions accepted only from the Automotive Trade  
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 that man can  
 make and money  
 can buy

One motorist chooses Silvertowns because they give him such long mileage. One motorist chooses them because of their easy riding, because of the comfort they give. One motorist insists on them because they wear so long. One motorist selects them because of their distinguished appearance. All because of quality. There is only one quality in Goodrich Silvertown Cords — one high quality of carefully selected materials and of expert workmanship. Sizes from 30 x 3½ up.

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**Goodrich**  
**TIRES**

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Cream glazed Terra Cotta

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KNOX &amp; ELLIOTT, Architects

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Beautiful

Profitable



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Mr. Clark introduced them and the factory official asked how the wagon was holding up.

"Oh, pretty well," said the farmer, "I can't complain—you see I've driven this wagon day in and day out for 30 years—pretty near 31."

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"No, your grandfather sold me

this wagon," said the farmer. "He promised it would hold up for years—and it certainly has."

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With a complete line of three chassis models and 13 bodytypes, each a six, the Studebaker dealer covers the entire quality market. He has the right car at the right price for every buyer, and is backed by the permanent asset of Studebaker good will.

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Roadster (3-Pass.).....975	Roadster (2-Pass.).....1250	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.).....1225	Coupe (4-Pass.).....1875	Coupe (4-Pass.).....2400
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THE STUDEBAKER CORPORATION OF AMERICA  
South Bend, Indiana



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Nash Leads the World in Motor Car Value

MANDEL  
8075 E. 4th St.  
Between Euclid and Prospect Ave.

And a signal also  
brackets to remove the  
the "professing" which has im-  
posed more unscrupulous than to-  
day.

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Almost twice as many Nash Cars were delivered the *past week* in Cleveland as have ever been delivered in any *one month* in the history of Nash business in this city.

Surely Cleveland is testifying its approval of Nash quality and sound business methods.

The Reeke-Nash Motors Co.  
6607-15 Euclid Avenue

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new coats.  
small boys &...

Bask.

Belted and half-jeh  
styles, swaggerly tallo  
and set-in or patch pockets,  
tuck trimming and collars of  
silk crepe, Rose, tan, blue.

2 to 6 Years—Info

Unusual Values i

Appar



1.  
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and tan mixture,  
of especially fine  
pale lined. Two per  
size 7 to 17 years.

12.85

Boys' Ship of all wool,  
tailored in plain mixture of  
and gray mixture. Two per  
size 7 to 17 years.

3.45

Boys' Linen Waist Suits in  
mildly and button-on styles. Two  
pairs of pants. One pair to  
match blue, tan or green trim-  
mings.

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Fashionable, Small-tongue

Satin-Tie Coloni

These Shoes, Were We To Buy Them At  
Would Cost About What You Pay For  
This Remarkable Event.

All Bench  
Made 7.85

THE sale price gives no adequate idea of  
these smart new shoes cannot do it  
workmanship, feel the splendid qual-  
perceive their grace of line to reali-



Ther  
be v

Published in  
CLEVELAND PRESS—April 2, 1923

Here is food for thought and reason for action  
for any dealer dissatisfied with his present  
line.

# NASH

THE NASH MOTORS COMPANY  
KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

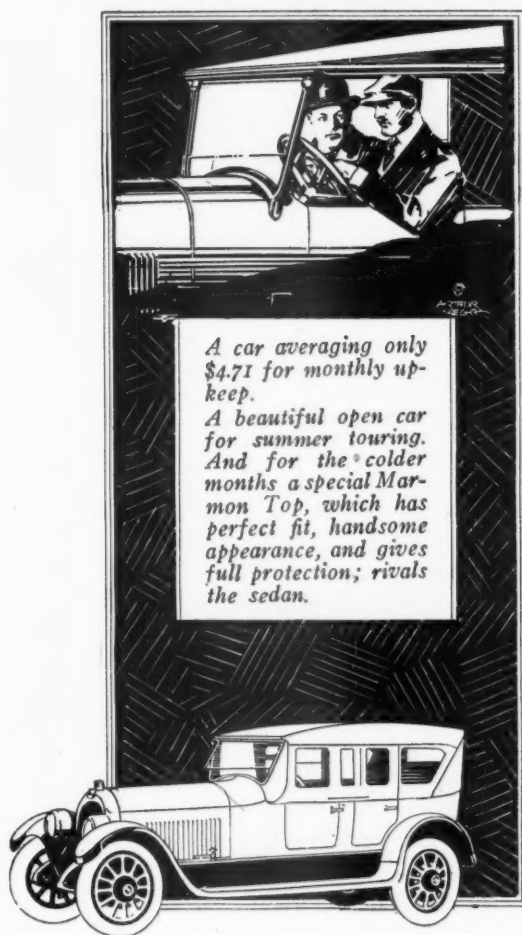
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With 3,000,000 cars to be marketed this year, the positive aid, based upon proved facts and undisputed advantages, which the Marmon Car and Marmon organization can give to its dealers, is an asset of immediate and growing value.



A dealer whose business is based upon a direct factory connection, a territorial analysis showing his exact position as to possible sales, a car averaging only \$4.71 for monthly upkeep and consequent clear profits unhampered by service costs—such a dealer is an A-1 risk for any banker.

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Exact details covering these and other facts may be had upon application. Write for them now, and KNOW about Marmon dealerships.

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Established 1851

INDIANAPOLIS

Address Inquiries to Dept. A.

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*This is the forty-first of a series of fifty-two advertisements appearing in this publication.*



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Better Job Quicker, at Lower Cost*

"X" Liquid stops leaks in leaky radiators *in ten minutes* and automatically prevents new leaks.

"X" Liquid dissolves rust and scale in radiator tubes, pump, connections, and water jacket and *prevents new scale or rust from forming.*

"X" Liquid is known to every motorist. Over 3,000,000 cans sold yearly is proof positive of satisfaction. Display "X" Liquid on your counter and in your window. There is quick sale and liberal profit.

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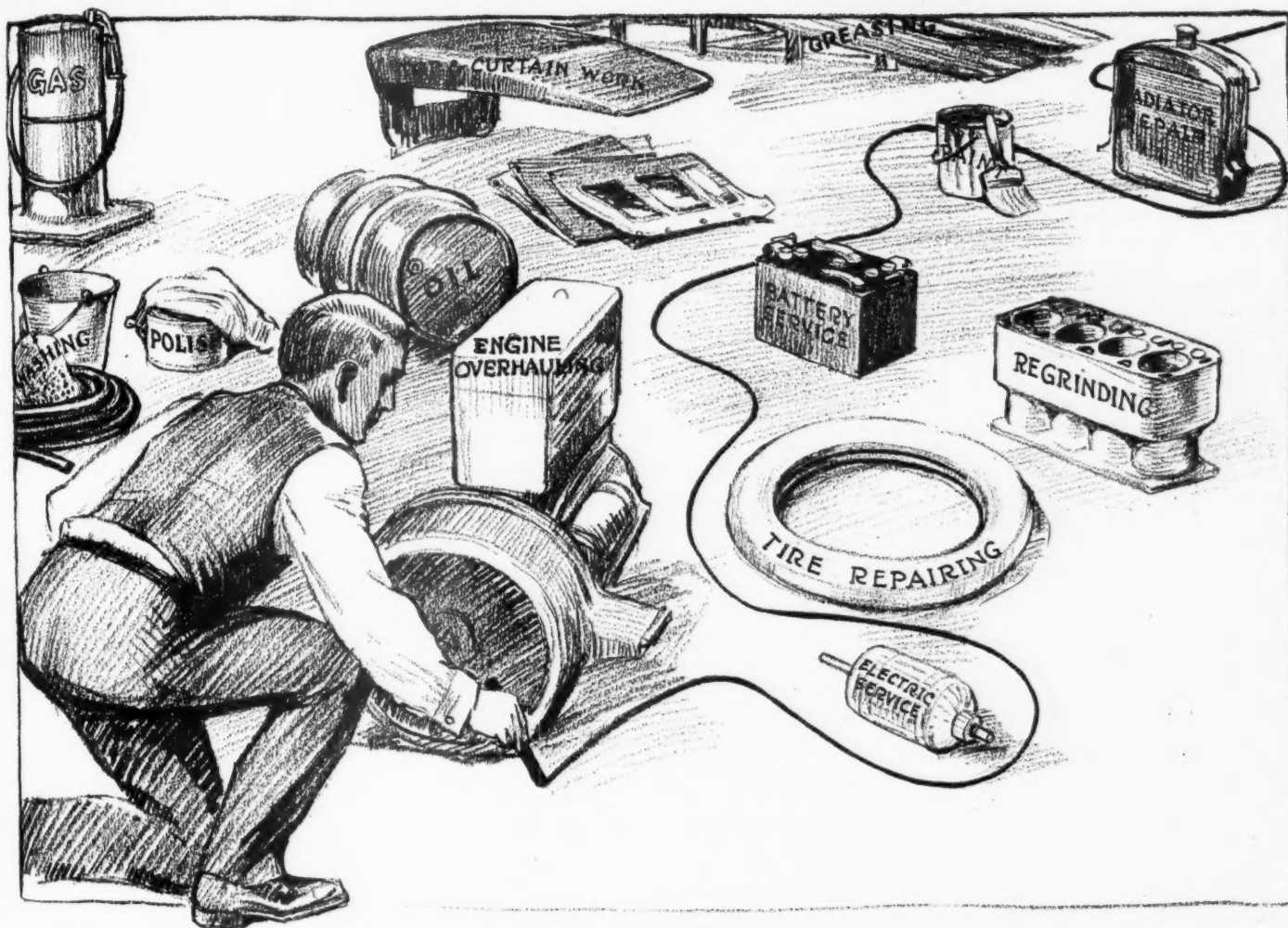
Factories: Boston and Montreal

# "X" Liquid

*Over 3,000,000 Cans Sold Every Year*



# MOTOR AGE



## Drawing the Profit Line on Maintenance

*With the Many Highly Specialized Forms of Selling Maintenance Such as Electric Service Stations, Tire Shops, Oiling and Greasing Stations, Automotive Machine Shops There Comes the Question as to How Much Work the Dealer Is Justified in Having Done Outside His Organization*

By B. M. IKERT

THE other day a conversation was started with a man who had been appointed a dealer in a town of some 25,000 people. This man had taken on a well known car and had had the agency for about six months. He had sold no cars as yet. When asked about what he was going to do regarding the maintenance and service work on the car he was going to sell, he answered,

"I have made arrangements with the ——— garage to handle all my work."

Now we happen to know this ——— garage. We do not believe that the dealer is going to be successful under the conditions because of the way he is going to split up sales and service. He will thank the customer after buying the car from him and then place him at the mercy of the ——— garage.

His reason for making such an arrangement is that he feels good mechanics are hard to get, that he does not want to carry a big overhead and that he feels the garageman is well established to handle the necessary

work for him. We believe this is going to work out with disastrous results because we believe every dealer, in order to keep the customer sold, must put forth some effort himself in the matter of maintenance.

This brings up the question of how much maintenance work necessary on a car the dealer should perform in his own organization. Some dealers say that so far as possible they feel it their duty to do literally all of the work. Others feel that there is justification in farming out some of the work. Then again, we have the very small dealers who arrange with some local repairman to do their maintenance work.

It is difficult to say how much of maintenance work the dealer should do to make it a paying proposition. Naturally the extent of the dealer's business, his location, size of establishment, potential sales and similar factors will largely influence the answer.

In our observations of dealer maintenance establishments we have noted frequently that dealers practice a losing proposition. Some overzealous salesman may have sold them equipment for which there is little use. It takes a long time to pay for certain equipment and if enough jobs are not taken in to pay for a machine, far better to farm out those jobs.

Some of the very largest maintenance buildings operated by dealers while they are fitted out with machinery and tools to do most any operation do not see fit to add a cylinder regrinder for example, because it is felt that this work is better handled in a shop making a specialty of it. But here again, the question of location has something to do with the case.

One may visit a hundred or more dealer shops in a city like Chicago and not find a cylinder regrinder and yet one might go into the shop of a dealer in a small town in Nebraska and there find a cylinder regrinder. It may seem paradoxical that a small shop in a small town should have an expensive machine, but the reason is plain when the conditions are analyzed.

In the large city there are good machine shops or automotive shops which may have one or several grinders. Or, there are concerns which do nothing but cylinder regrinding. The dealer is not warranted in putting in a machine to compete with these shops. He therefore farms out the work.

In the small town which is remote from a large city, but in which community there are many cars, trucks and tractors, a dealer is warranted often in installing some expensive machine like a regrinder. He has a big field from which to get the necessary business to keep the machine in operation and as is often the case, if such a shop does the work of fitting the pistons and rings also, it obviously will not take long for the machine to pay for itself. Naturally one dealer thus equipped can take care of a community and it would be out of the question to have other dealers install machinery to do similar work. They cannot all be kept busy.

There was a time when many dealers thought that it would be better to divorce service or maintenance from sales. The dealer was to sell cars exclusively and leave the maintenance work to some other organization. They said the service work was not profitable and that they rendered it only because they felt certain obligations to the customer and because the factory insisted upon it. The dealers felt that the selling of cars was the rosy end of the business and so it was in the halcyon days when cars could not be delivered fast enough and the dealer had to put forth little or no effort to sell. Little or nothing was thought of maintenance or future sales.

But in the last year or two much has been said about selling cars from the back door of the establishment, meaning of course, that maintenance of the right kind was looked upon to sustain a customer's faith in the establishment so that when in time his car had served its purpose so far as he was concerned he would buy another car from the same dealer.

The dealer who today does not realize that it is the selling of maintenance and sustaining the faith of the customer to whom he has sold his product which will assure the future success of his business might as well pack up and go to selling corn shredders or life insurance. There may be more money in either of them for him.

Since the industry and dealer clientele has pretty well accepted the fact that it is the maintenance end of the busi-

ness through which cars will be sold and kept sold, it brings up the old question again as to how far the dealer shall go in the fulfillment of it. Every dealer in every city surely cannot install lathes, grinders, forges and such things. It would be a vast economical waste.

At this point it may be well to go back a little and see what has happened so far in the maintenance end of the business. It was not so many years ago that a man who sold automobiles sold everything else that was associated with automotive vehicles.

He had to sell gasoline and oil. He sold and repaired tires. He had to do all the electrical repair work; oiling and greasing; much of the painting and practically all of the mechanical work. He had to do these things because there were no shops making a specialty of any one item. But today, things are different.

Take gasoline filling stations. Since the vast number of filling stations have opened up all over the country the dealers have found it less and less necessary to have this branch of service as a part of their business. Even some of the newer and larger maintenance establishments have not added gasoline and oil dispensing units for the use of the public. What gasoline and oil they do handle is only for their immediate use and for the shop.

The situation with the selling of lubricating oil is a little different. When a maintenance department drains a crankcase the oil must necessarily be replaced and consequently it must be on hand. The same is true in repair work when an engine has been torn down and reassembled. The case must be refilled. So, oil must be kept on hand at all times. Even with this in mind, it is safe to say that the oil thus sold does not begin to equal that dispensed by the exclusive filling station. Thus in a sense we might say that the gasoline and oil business has become a business in itself and literally divorced from the dealer's organization.

Now take tires. The dealer who has a tire repair department is the exception these days. There are too many tire shops with which he cannot compete. As cars and trucks grew in number there began springing up everywhere tire sales and service stations. The better construction of tires and the introduction of cord tires also has had its influence and today the thought is that a tire might as well be junked after it has gone its distance because it is cheaper to buy a new one than repair the old.

Many dealer's shops, especially in the smaller towns are equipped to repair tubes, but so far as doing a general tire repair business on a large scale, they are few and far between. Many large service stations have given up tire repair work simply because they felt it did not pay, so long as there were shops making a specialty of the work. So much for tires.

Consider oiling and greasing stations. In the larger cities and in a few of the smaller towns we find springing up organizations which make a specialty of oiling and greasing the motorists' cars. These organizations have special equipment with which to do the work and consequently can do a good job of it and in less time than the dealer's shop usually. The work includes draining and refilling the crankcase, rear axle, gearset, lubricating the spring leaves, shackles, etc. The prices usually are reasonable and the result is that these places are well patronized, especially in view of the fact that the work can be done while the owner waits.

The same is true of washing stations or laundries. They wash a car while the owner waits or transacts business. Ask most dealers who operate a service station and they will tell you car washers are hard to get. They rather prefer to have this work done elsewhere and the automobile laundry or the combination oiling-greasing-washing establishment seems to be the answer.

The electrical end of the business. In the early days when we did not have starting motors or generators the ordinary dealer's shop could take care of ignition troubles pretty well. In those days a coil, a timer, some dry cells and switches made up most of the electrical system and no special apparatus was required to take care of the repairs or adjustment.

But times and electrical systems changed rapidly and today a man must specialize in automotive electrical repair work to know what it is all about, because the systems embrace so



much. Starting motors, magnetos, distributors, coils, generators, cut-outs, relays, switches and batteries embrace so much that they must be given special attention.

Today automotive electrical service and maintenance is a highly specialized industry in itself. There are few dealers, for instance, who maintain a battery department. Perhaps they have a small charging rack for the convenience of customers, but nothing is done to get a volume of business, nor is there provision for rebuilding batteries. The battery-service stations take care of the bulk of this business and even towns of a few hundred population now boast of a battery shop. Often these battery stations also go a step farther and do generator and starting motor work, ignition work, lighting system work. In short, they are complete electric maintenance stations to which the motor car dealers in such a community can farm out their work.

Now take the case of painting and upholstering. The refinishing of automobiles, trucks and other automotive vehicles is a big part of maintenance work. Yet you do not find many dealers, excepting in the very large cities, who operate a paint and trim shop in connection with their other work. It is true that many a small dealer probably could add to his profits if he added a paint and trim shop, but as things stand now the average small town dealer, or even many of those operating in large cities, prefer to send their paint and trim jobs to a shop making a specialty of the work.

We come to another point which has been under discussion for some time and which bids fair to become important as time goes on and we keep adding more motor vehicles to the millions now in use. That is the point of unit service. The thought is that there should be service stations or shops given over entirely to the servicing of one or two units. Thus the maker of an engine would establish a maintenance shop to which dealers could refer all engine jobs which required tearing down and rebuilding, all of which may require special equipment. This is already being done in many cities. With many dealers sending their work to such a shop it is obvious that the latter could afford to put in equipment and establish methods entirely beyond the reach of the individual dealer.

Still, in the face of all the specialization of the past few years we can go out and find instances where exactly the opposite holds true. We can go into a small town and there find a dealer operating a maintenance department that is completely equipped to do almost any job from ignition work to painting and trimming. He may even have a regrinder for cylinder block work. The only job he cannot tackle is that of cutting gears, perhaps.

Then again, we can find a dealer operating in a large city and who handles a high priced car on which the volume of sales is small, perhaps. Yet such a dealer may want to round out his service work and maintenance so completely that he sees fit to install an electrical repair department so that his customers will not have to go outside his organization to get service. You always will find dealers in any community, large or small, who feel that they want to be able to take care of their customers' wants regardless of how infrequently such cases may come up.

We recall a case where a maintenance department has installed a complete apparatus for repairing radiators, simply with the thought that a customer may come in for this class of work and they want to be equipped to take care of it. It is this desire to stand behind the car they have sold in every way that prompts many a dealer organization to so

equip its place of business that it is independent, literally speaking, of outside help.

Let us refer again to the dealer mentioned at the start of this article who had taken the agency for a car, had had it for some six months and had made an arrangement with a local repairman to do "his work." Now by "his work" he meant the maintenance and service necessary on the cars he would sell. Whether or not this will pan out well remains to be seen, but the arrangement at best is questionable in several ways. The repairman is not going to confine all his time to the particular cars that dealer sells.

There comes up the question of inspecting the new car when it comes from the factory of the distributor. Will the repairman go over the car as thoroughly as a dealer's service organization?

The dealer who makes an arrangement like this takes a chance. The repairman seldom has new car inspection blanks such as we find in many dealer service organizations and there is but a remote chance that such a dealer will have a "history" of cars thus turned over to a repairman to be put into shape for a customer.

Such a dealer may say he has no service troubles because he has turned all this work over to the repairman, but from our observations we feel sure the majority of dealers will agree that the arrangement is pretty nearly sure to prove a failure. The dealer may get by, so to speak, but he never will be held up as a successful dealer in his community. He has overlooked the greatest item in selling cars in the future. It is the extreme in the matter of trying to solve the problem as to how far a dealer should go in handling service matters.

The man who buys a car naturally looks to the man from whom he bought it for service. Some service and maintenance always will have to be a part of the dealer's business. He cannot divorce them entirely from sales because if he does there will be no future sales. This will hold true at least so long as many car makers keep changing models because

it will take someone in the dealers' organization to see to it that such new models are properly presented to the customers. Changes in models frequently necessitate a change in service operations and unless a dealer has his own maintenance organization it is difficult to see how such changes in operation can be intelligently interpreted to the independent repairman who may be doing work for several other dealers.

In the smaller towns the dealers' maintenance department frequently has to be an all around shop and do a little of all the various kinds of work. It is true that much of this work will consist of inspections and adjustments only but it is just such things which frequently make or break the dealer.

If a new customer is given assurance that his car has been properly conditioned, he puts faith in the dealer's organization. If for example, he is given an inspection report on a brand new car, showing that all points have been properly lubricated, that the brakes are in proper order, that no tools are missing from the equipment, he is very apt to seek the help of the organization later on when adjustments or repairs are necessary. He will not be so keen to hunt up an "alley repairman" and thus be lost to the dealer maybe forever.

The advancement in recent years in the design and construction of motor cars is of direct benefit to the dealers, particularly in the small towns. It is well known that today we are getting excellent products from the factories so far as their design and makeup is concerned. It is true that cars may come through occasionally with a faulty unit here and

## After the Sale of the Car

IT is the "after market" which yields a larger net profit to the automotive dealer than the sale of the car.

WHILE on the face of things it may appear that maintenance is resolving itself into a lot of highly specialized businesses such as electric service stations, tire repair shops, oiling, washing and greasing stations, radiator shops, etc., the fact of the matter is that even with these the automotive dealer must keep a great share of the business under his own roof.

THE dealer is justified in many cases where he sends out certain work to be done by a shop in much better position to handle in frequent operations. But some tools and some equipment is necessary in the dealer's shop to handle the operations which ought to form a part of every dealer's business. If this is not done the dealer hands over to the specialized shop all of his assets except the net profit on the sale of the car, which is usually pretty small.

AFTER the sale of the car is the time when the dealer starts to reap the benefit of his sales efforts and the sales effort for succeeding customers can take no better form than that of well organized and intelligently sold maintenance on the cars he already has out in his territory.



there, but in the main the cars are the best ever turned out by the factories.

This means that many former service troubles are partly or entirely eliminated. Some operations, which formerly were performed every now and then on a car, now are seldom performed. Take the case of gearsets. In the olden days it was more or less common to see a mechanic installing new gears or bearings in the gearset. Today it is unusual to go into a shop and see a mechanic tearing down a gearset. In fact, certain units about a car now are so designed and built that they will practically last the life of the car if they are given attention. Certain adjustments will be necessary if it is true, but these are easily performed now and do not constitute a major item.

Take the case of squeaks and rattles. These troublesome items made up a large part of the service work formerly and often were of such a nature that the service man was powerless to overcome them. It was an inherent fault of the car construction and could only be remedied by the maker. Much has been done in the past two years to overcome squeaks and rattles by the use of more rigid frames, anti-squeak material, better body design, and chassis lubricating systems. Hence the problem of service in this respect has been simplified.

There is always the parts situation to be considered. New parts are necessary in older models and in case of breakage on the new models. The most logical place for the customer to buy parts is from the dealer who sells the particular make of car he is driving. Most dealers make a profit from selling parts and there is always a question as to who could install these parts. If it is up to the dealer to handle parts it will appear logical that he should also get the job of installing. In most cases this is done of course. However, there are some dealers who think it would be well not to handle parts. Their idea is to have these distributed from some central source, a source from which all service stations and shops could draw. In other words, such an institution would be the official representative of the maker whose units are incorporated in many car designs.

It is not possible at this time to tell the future course of maintenance. One thing is very sure, however, and that is that the man who sells cars will sell them on the strength of

maintenance. He will sell them because he has given his customers in the past exactly what they wanted. He makes sure that the car is right when it is turned over to the customer, he keeps in close contact with that customer and builds up good will toward his organization.

The small dealer who "does his own work" and conscientiously tries to keep the customer's faith in the product he has bought, will see to it that his place of business is organized in keeping with the modern version of selling maintenance. He may not have a cylinder regrinder but this will not prevent his taking care of a customer's car which may need a regrinding job and fitting of new pistons. Such a dealer will be salesman enough to sell his services properly to the customer even though he does farm out the work. What the customer wants is a good job. He is willing to pay for it and doesn't care where the work is done so long as the dealer stands behind the job.

There can be little question about the stability of the dealer who does not consider his establishment as an automotive business. Experience in many communities has demonstrated that few if any dealers can make a living by selling cars at present discounts, unless they have other lines of profit.

The dealers who are making money and who are winning the respect of banks, finance houses and their own factories, are those who are using a car agency as the foundation of a "transportation store." This business includes the sale of cars, accessories, tires, maintenance and perhaps trucks, all at a profit. It is the men who are building a business with the car as a basis, who are building a business that will be salesable or something to leave to their sons.

The question of just how large jobs a dealer shall undertake becomes a job of figuring the work in prospect. No dealer can feel that he is in the automobile business without a shop that includes some tools and labor saving equipment. If he hands over his cars to another establishment, he is handing all of his assets to this company except the net profit on the sale of the car (which is very small). Those dealers who have used the car as a basis for building a "transportation" store have found that the "after market"—that market created by the ownership of a car—yields a larger net profit than the sale of the car itself.

## Pointers on Points

The operation of any ignition system depends on suddenly stopping a current so that a secondary voltage high enough to jump a spark gap may be produced. In stopping the current known as the primary current a condenser is employed to reduce the arcing or flashing at the contacts but in spite of the condenser a certain amount of arcing is always present.

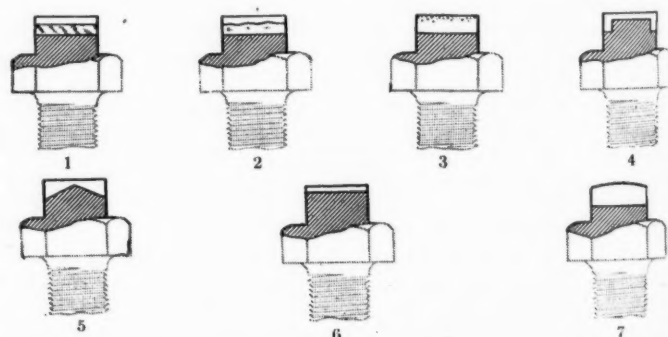
This condition at the contacts tends to oxidize the surface of the metal and this is especially true in the case of ordinary metal such as iron or copper so that the contact surface must be of some special metal such as platinum combined with iridium.

The fact that both of these metals are rare and expensive explains the high cost of magneto contacts when made of pure materials of adequate size.

To make it possible for replacement contacts to sell way below genuine ones it is accordingly necessary to cut either on the quality or the size or both. In the illustration given the methods used are clearly shown, whereby a lower price is possible but the value received is possibly lower in proportion than the price.

Illustration No. 1 shows a thin layer of platinum mounted on a thick section of nickel. The nickel is polished so that it closely resembles and can hardly be detected from the platinum. The purchaser then, if he inspects the contact, will rarely notice the deception and will figure he is getting a contact having a thick layer of platinum.

Contact No. 2 represents a point where the platinum has been soldered on. The nature of the platinum and solder is such that the solder works up into the contact and mixes or alloys with it to a considerable distance thus destroying the effectiveness of the platinum. When the contact has worn away down to the point where the solder is alloyed with the platinum



the operation will no longer be satisfactory, for excessive flashing will result and the spark will be weak.

Contact No. 3 shows a layer of impure platinum mounted on the contact screw. These impurities are difficult to discern but have a big effect on the operation producing flashing at the contacts and consequently a weak secondary spark.

Contact No. 4 is obviously made with the idea of using a minimum amount of platinum but showing an appearance which gives the idea that thick layer is used.

No. 5 accomplishes the same result by a little different construction.

No. 6 uses a thin layer of platinum and makes no attempt to conceal the fact.

No. 7 represents a genuine contact screw having a thick layer of good material which is slightly crowned so as to give a good contact even if the adjustment is not absolutely correct.

Electrical service stations which place any value whatever on their personal reputation in the community will do well to seriously consider the information above given and demand a line of contacts which will give satisfactory service.

## Four Truck Models Announced By American-LaFrance Company

*Enters Truck Field After Half Century Experience in Building Fire Engines. Sizes to Range from 3-4 to 5 ton. Two Models Now Ready*

FOUR models of trucks from  $\frac{3}{4}$  to 5 ton have been announced by the American-LaFrance Fire Engine Co., which company has for over half a century built fire engines. The trucks are similar in design and differ mainly in the size of the units. Two models, the  $3\frac{1}{2}$  and 5 ton, are now coming through in production.

The engines both have 6 in. stroke, the  $3\frac{1}{2}$ -ton model having a  $4\frac{1}{4}$  in. bore and the 5-ton model a  $4\frac{3}{4}$ -in. bore. The wheelbase is 165 in. in both cases. The chassis weight of the smaller model is 7600 lbs. and of the larger model 9000 lbs. Worm drive axles are used and the tire equipment is 36x5 all around for the small model, 36x6 front and 40x6 rear for the large model. The chassis prices are \$4950 and \$5500, respectively.

There are a number of unusual features of design incorporated in the chassis, including a dry plate clutch with self-aligning plates, simplified governor with micrometer adjustment, counterbalanced chrome nickel crankshaft, an oil sediment partition in the engine, wick lubricating king pins, air cooled transmission brake, plastic nickel bronze universal joint, radius and torque end bushings and adjustable brake and clutch lever pads.

To provide for ease of maintenance, the engine is assembled complete with clutch, accelerator pedal rods, levers, etc., and can be removed from the chassis without disturbing any of the parts. The gearset is also a self-contained unit with its shifting forks and sliding shafts integral with the gearcase cover.

The cylinders are of the L-head type cast in pairs. The engine is three point suspended, the front support being on a drop-forged cross frame member fitted with trunnion bearing.

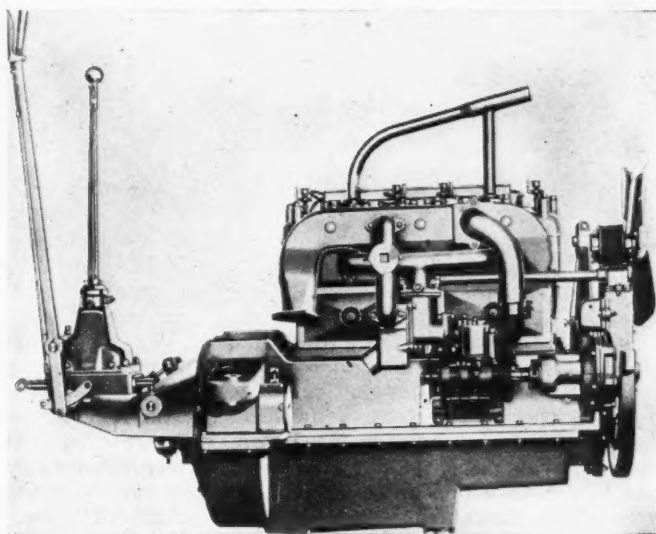
The lubrication system is of the pressure type to the crankshaft and camshaft bearings. The two auxiliary shafts driving the water pump, magneto and generator are also pressure fed. The pump circulates only the oil which has flowed over the top of the dam and which is free of sediment.

The engine is provided with a governor which is designed for ruggedness. It is of the centrifugal fly ball type but in place of the usual weighted bell crank lever, the centrifugal action is exerted by four large balls acting against a cone-shaped shell which is pushed forward when the engine approaches the maximum speed to which the governor is set.

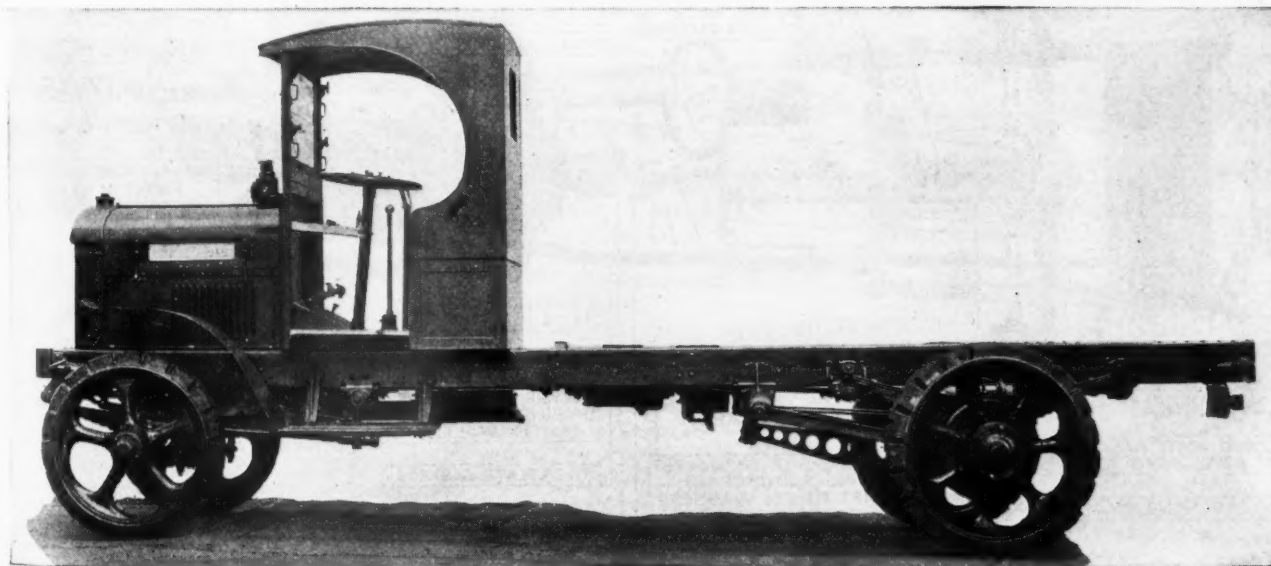
The fan, instead of being driven from a crankshaft pulley, drives from a pulley on the end of the auxiliary shaft, this giving the equivalent of crankshaft

speed. The hand crank ratchet on the front end of the crankshaft has six ratchet teeth instead of the usual two or four.

The clutch is of the dry plate type and one of the features is the aligning cone, which forces the engaging spring to exert an equal pressure on all parts of the clutch disk. The spring pressure can be adjusted without removing any part of the assembly. The engaging linkage is of the toggle lever type, allowing the necessary pressure by the clutch spring, yet keeping the foot pedal



*Right side view of the American La France engine with clutch in unit*



*Side view of the 5-ton American La France truck*







## New Stewart 1-Ton Model At \$990

*Truck Has a 130-in. Wheelbase and a Road Speed of Over 40 Miles Per hour.  
Electric Starting and Lighting Regular Equipment*

A NEW one-ton speed truck has been announced by the Stewart Motor Corp., Buffalo, N. Y., and will be listed at \$990 f.o.b. factory.

The engine is of the four cylinder type, 3¼-in. bore by 5-in. stroke, SAE rated at 22½ hp. Besides having full pressure feed lubrication, which is automatically controlled by a lever connected with the foot accelerator, the engine has a 5-bearing crankshaft. All the connecting rod and crankshaft bearings are bronze backed babbitt lined. In addition to having a removable cylinder head, the cylinder block is also removable. The crank case is ribbed to prevent distortion and vibration. The pistons are of cast iron. The cooling system is of the thermo-syphon type.

The carbureter is a Zenith, and Remy starting, lighting and ignition is used.

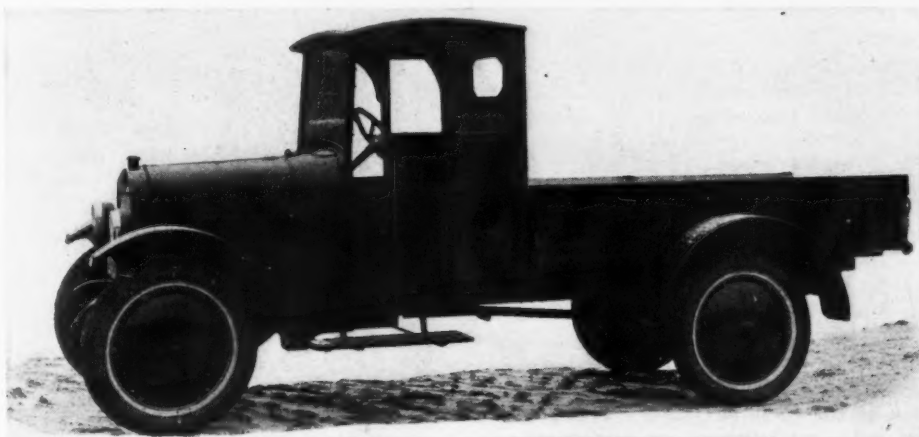
The clutch is of the multiple disc dry plate type, with automatic adjustment, having four discs with double facings and three plain discs, eight inches in diameter.

A Gemmer worm and gear type steering gear is used, with spark and gas levers mounted on the wheel. The front wheel hubs are equipped with Timken roller bearings. The cross tie rod back of the axle beam is of the new ball and socket self-adjusting type.

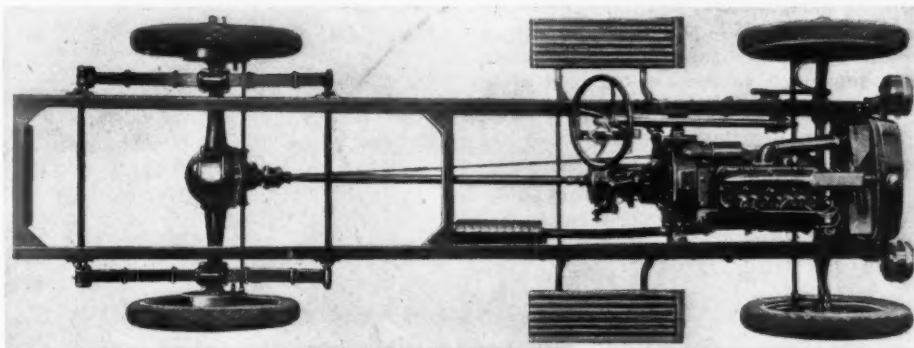
Front springs are 38½ in. long, 2¼ in. wide, with bronze bushings and ¾-in. spring pins. There are eight leaves in the front springs. Rear springs 50 in. long, 2½ in. wide, bronze bushings in spring eyes and 1 in. diameter spring pins. Twelve leaves in rear springs.

The rear axle is of the truck type bevel, having spiral gears with straddle mounted pinion. The rear axle is equipped throughout with Timken bearings, except in the case of the pinion shaft, which is carried on large type annular bearings. It is of the semi-floating type. Axle shafts are 1½ in. in diameter. The differential ring gear has 51 teeth and is 12 in. in diameter. The gear ratio is 5.1 to 1. The large differential is of the Brown-Lipe make. The housing is of heavy pressed steel, reinforced by a long inner sleeve. The ends of the housing are also reinforced by a large steel casting riveted to the ends of the housing, and on which are cast the spring pads. All parts of the rear axle are easily accessible through the rear plate, or by removing the pinion housing.

There is but one set of brakes on the rear wheels, 14 in. in diameter, 2¼ in.



*The Stewart 1-ton truck with open express body*



*Airplane view of the Stewart 1-ton chassis. This gives a good idea of the accessibility of the various units*

wide, of the internal expanding type, operated by a cam. The emergency brake is supported on the rear of the transmission.

Wheels are disc steel type, fitted with Firestone demountable rims. Tires are 34x4¼, cords. The rims will oversize 35x5.

### Automotive Repair Books

Two books by J. C. Wright on the subject of automotive repair are being published by John Wiley & Son, Inc., New York. These books are of interest to the automotive maintenance man and especially to those interested in the electrical system. The first volume, although essentially devoted to mechanical details of automobile maintenance, also takes up a number of electrical systems, while the second volume is devoted exclusively to the theory and practice of electrical service work.

In the first volume the first chapter deals with chassis work, many points being given as for example the best procedure to follow in repairing bent and broken frames, straightening a bent front axle, repairing a broken wheel, best

method of treating clutch leather and method of relining Ford transmission and brake bands. Many other items of interest too numerous to mention are also given. Other chapters in the first volume deal with engine work, electrical work, trouble shooting, body and radiator work, automotive engine lubrication, cooling system, tires and tubes, and several chapters are also devoted to starting, lighting and ignition.

In the second volume the first chapter is devoted to numerous small jobs on the electrical system, such as cleaning spark plugs, replacing fuses, cleaning battery terminals, installing spotlights, timing ignition, repairing a Bendix, timing a magneto and rewinding armatures. Other chapters are devoted to magnetism, electromagnets, electrical units and measurements, batteries, generators, starting motors and ignition.

# New McCormick-Deering 10-20 Two Plow Tractor Announced

*Accessibility One of Its Chief Features. Engine Has Ballbearing Crankshaft. Roller Bearings in Front Wheels*

THE new McCormick-Deering 10-20 tractor is essentially a small-farm machine, being designed to pull two plows under average soil conditions, and to drive by belt small threshers, ensilage cutters and similar machines. The tractor is equipped with a valve-in-head four-cylinder vertical engine, which operates on kerosene or other low-priced fuels. It is controlled by a throttle governor. Power is transmitted to the rear wheels through a large spur gear. The tractor operates at three forward speeds (2, 3 and 4 miles per hour.)

The outstanding feature of the new 10-20 tractor engine is the ball-bearing crankshaft. Another feature in the design of the 10-20 engine is the provision for easy replacement of all wearing parts. The engine block, for example, acts only as a frame to support the wearing parts and the casting itself need never be replaced unless it is allowed to freeze up or it meets with some accident, inasmuch as there is no part of it which takes any wear.

The main bearings, as already mentioned, are of the ball type, and, of course, replaceable. The cam shaft bearings are of bronze and can be easily renewed. Separately cast cylinder sleeves are used. With this construction, also,



*Side view of the new McCormick-Deering Tractor. Special attention has been given to the comfort of the operator*

harder and closer-grained metal is possible, and more uniform cooling and better lubrication results.

The frame forms an enclosure for the clutch, a dust and oil-proof housing for the entire working mechanism, and provides the necessary compartments so that all gears run in oil. Ball and roller bearings at 28 points reduce friction to a minimum and add to the ease and smoothness of operation of the tractor.

The steering is almost as easy as on an automobile, it is stated, due to the bearings in the steering knuckles, the lubricating facilities, the large steering wheel, and the worm and gear mechanism.

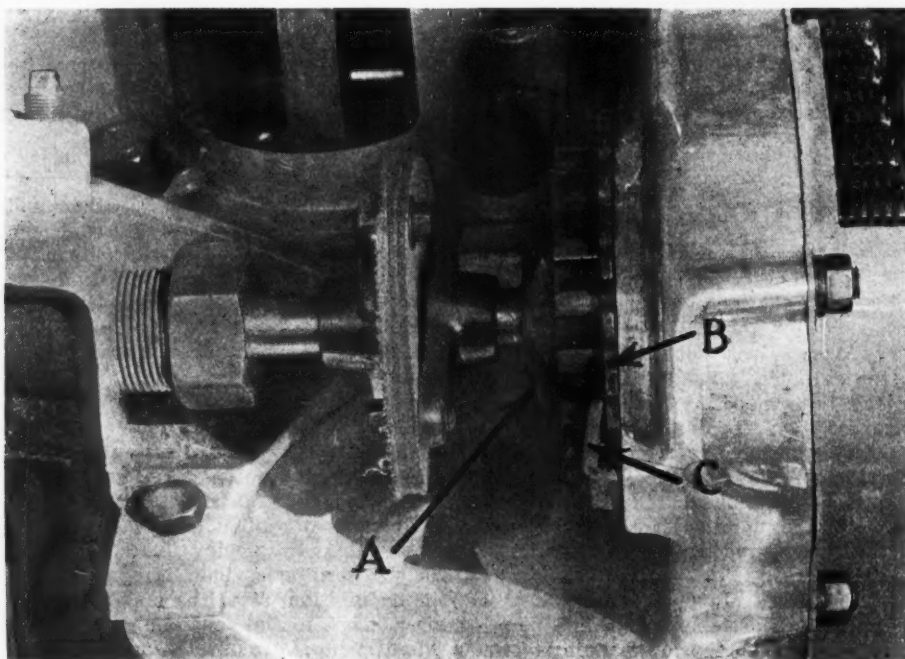
The gear shifting is done in the same manner as on most automobiles, with the additional advantage of a special transmission brake which keeps the gears from spinning while being shifted.

## "Electricity and Its Application to Automotive Vehicles"

By Paul McDowell

"Electricity and Its Application to Automotive Vehicles," is the title of a book being published by the B. Van Nostrand Company, New York City, the author being Paul McDowell Stone, assistant principal, Michigan State Automobile School. This book not only goes thoroughly into the question of electrical theory, but shows how this theory may be practically applied in trouble shooting in the average shop.

## Another Instance of Helping the Maintenance Man



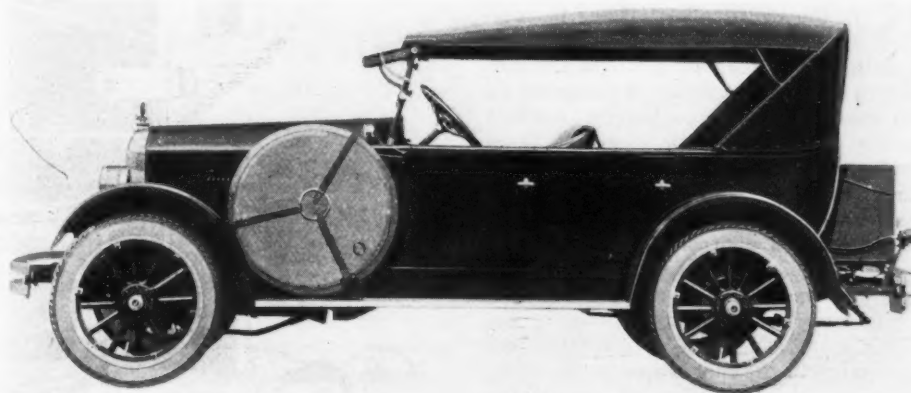
*Here is shown the outside adjustment of the front end drive chain on the Chandler. The position of A governs the adjustment and this is held fast by B and held thus by the lock C*



## Recent Developments In The Motor Car Field

### Jewett Adds Equipment to Models

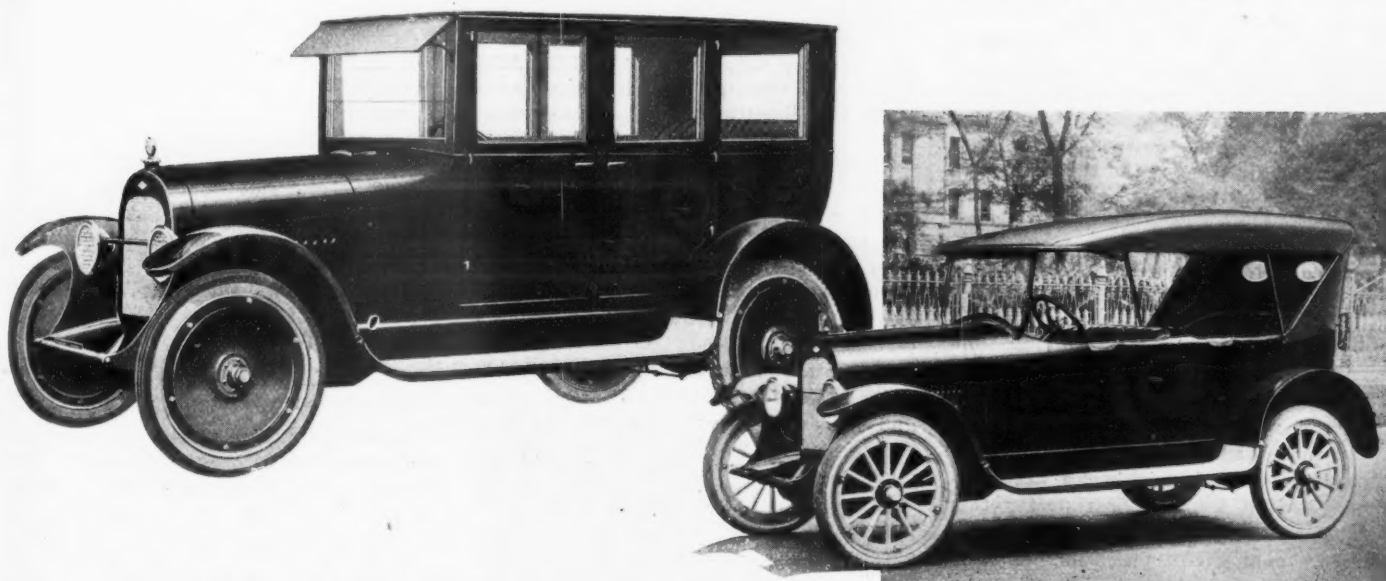
ADDITIONAL equipment has been placed on the line of Jewett specials consisting of the touring car, sedan and coupe. These cars are now finished in blue devil blue. The open car is upholstered in hand crushed Spanish leather and the closed cars are upholstered in wool cloth. On the touring car and sedan the spare tire, which is standard equipment, has been moved to the front of the left running board, leaving the rear clear for a trunk and trunk rack. Double bar spring bumpers are furnished for all three cars, front and rear, and in addition, the standard equipment now includes motometer, rear view mirror, stop light and automatic windshield wiper. Disk wheels can also be secured



*The Jewett Special touring car which comes completely equipped and in a choice of several colors. Disk wheels also can be had for this model*

for this car at \$25 additional. The prices car, \$1220; sedan, \$1695, and coupe, for the cars f. o. b. Detroit are, touring \$1625.

### Low Price Features Open and Enclosed Models of Monroe



*The open and closed models of the Monroe made by the Stratton Motors Corporation. They have a 103-in. wheelbase and are powered with a four-cylinder engine having a rating of 15.63 hp. The touring and sedan sell for \$965 and \$1465 respectively*

### The Dealer's Importance

DAY by day, the "Ask 'em to Buy" is becoming more and more a part of the automotive accessory and equipment industry. At first it seemed that the manufacturers were not giving this message the proper support and that the manufacturer appeared to consider this something merely for the small dealer. But times change and we find this phrase being repeated over and over and each repetition brings an interpretation. The following appears on the cover on a

recently issued trade catalog and is addressed to dealers:

#### HOW MUCH WEIGHT DOES YOUR RECOMMENDATION CARRY?

The "Ask 'em to Buy" policy is a wonderful business builder—but it won't produce sales unless it is supported by good merchandise, scrupulous treatment, prompt service, absolute integrity.

You can make it increase your volume by hundreds or thousands of dollars, on one condition — THAT YOU BUILD BENEATH IT A FOUN-

#### DATION OF CONFIDENCE!

Your recommendation is just as good—or as worthless—as the product you recommend.

Quality merchandise builds confidence. It makes your recommendation as good as a certified check. It repeats—and repeat business is the thing that cuts down overhead and lengthens net profits.

"Ask 'em to Buy," by all means, but back up your request with the kind of merchandise that will make it effective—for example, FARRAN-OLD Fan Belts.



## Cadillac Carbureter Altered to Compensate for Varying Temperatures

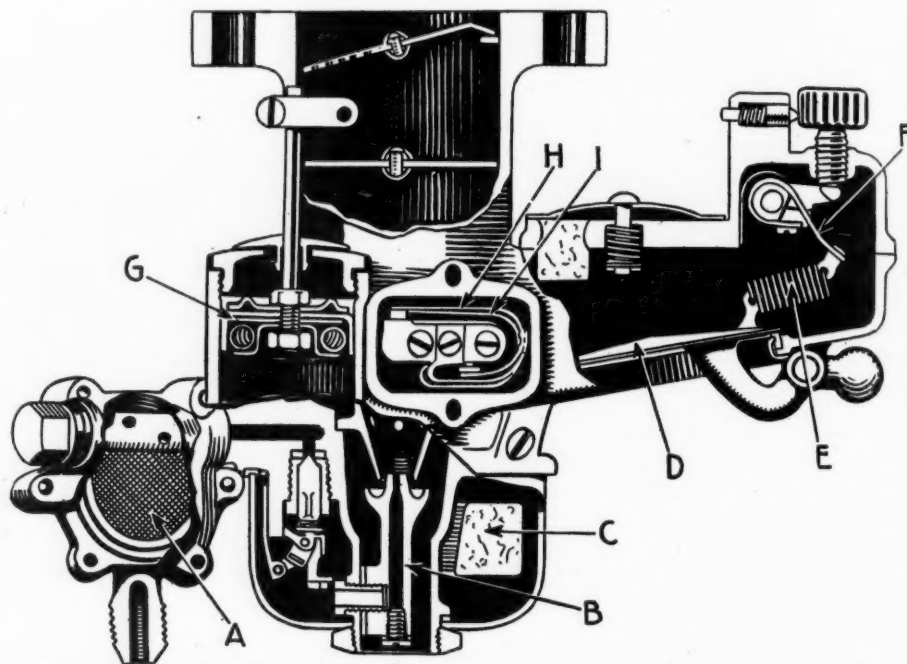
**R**EVISIONS have recently been made in the Cadillac carbureter to compensate for varying temperature conditions. Instead of a single thermostat to govern the relief of pressure on the gasoline in the carbureter bowl, a double thermostat with elements functioning at different temperatures is now employed. This new arrangement greatly increases the effectiveness and range of the thermostat control. A novel straining device has also been added to take care of conditions in certain parts of the country using unusual mixed or peculiar fuels. There is also a detail improvement in the fuel needle valve, which eliminates the possibility of its sticking on its seat.

In principle and in fundamental details of construction, the Cadillac carbureter, which is an air valve type, has not been altered. At the time the Cadillac Type 61 was brought out the carbureter was fitted with two thermostats to compensate for temperature conditions. One of these thermostats, which has been retained without change in the present design, controlled the tension on the auxiliary air valve spring, the tension decreasing with rising temperature. The other thermostat controlled a relief opening connected by a passage with the carbureter bowl, the object being to modify the effectiveness of the throttle pump to take care of rising temperatures. This thermostat is also retained in the present design, but is combined with the new thermostat, forming a double unit.

### Action of Throttle Pump

A throttle pump has for a long time been a feature of the Cadillac carbureter. The purpose of this throttle pump is to force an additional supply of gasoline through the spraying nozzle when the throttle is opened quickly for acceleration. In the Type 61 carbureter this throttle pump takes the form of a plunger connected with the throttle mechanism, the chamber in which the plunger operates being connected to the upper part of the carbureter bowl. If the throttle is opened slowly, the throttle pump has little or no effect on the gasoline forced through the spraying nozzle, as a small vent which communicates with the bowl, and which is open at all times, tends to prevent compression of the air. If the throttle is opened quickly, however, the air is compressed below the plunger and the increased pressure on the gasoline in the bowl causes more gasoline to pass through the spraying nozzle.

It is evident that in accelerating with the engine cold, the throttle pump should produce its greatest effect, and that as the temperature rises, the same accelera-



Sectional view of the new Cadillac carbureter. A, fuel strainer; B, spraying nozzle; C, concentric float; D, auxiliary air valve; E, auxiliary air valve spring; F, thermostat; G, throttle pump; H and I, throttle pump control thermostats

tion can be obtained with less assistance from the throttle pump. Accordingly, when a temperature of approximately 70 deg. is reached, one of the units of the double thermostat opens a relief hole, which permits the escape of some of the air compressed by the throttle pump. Operating the throttle pump then produces less compression of the air in the bowl and less gasoline is forced through the spraying nozzle.

The other thermostat of the double unit, which is the new one, also opens and closes a hole leading to the carbureter bowl. The opening, however, is much larger than that controlled by the first thermostat, and the thermostat does not function until a much higher temperature is reached—about 135 deg. The characteristics of the various fuels which are now in popular use are such that at high temperatures they have considerable vapor tension, and the resulting pressure in any closed container must be relieved.

Neither of the thermostats of the double unit has any effect upon the supply of air admitted to the carbureter either through the primary or the auxiliary air inlets.

### Taking Care of Mixed Fuel

The arrangement for taking care of mixed fuels consists of a refined cleaning device which not only acts as an actual dirt remover, but also breaks up the incoming fuel and removes the bubbles. Fuel enters from the source of gasoline supply through a series of dif-

ferent sized screens of bronze wire mesh, arranged as circular disks. These disks are not placed normal to the entering flow, but lie flat, so that the gasoline enters at one side opposite one face of the series of laminated disks and goes out the other side opposite the other face of the disks. This gives a sort of slanting flow through these disks of bronze mesh. After leaving the disks, the gasoline enters through staggered holes into the tube which leads to the float chamber.

### Auxiliary Valve Retained

The auxiliary butterfly valve, which has always been a feature of this carbureter, has been retained. It is located above the main butterfly. It is held very lightly on its seat by a coil spring. The valve is unbalanced by having one side perforated with a number of small holes and the other solid, so that with this difference in area on the two sides, the suction of the motor will tend to keep the valve open. In very slow, heavy pulling on high gear with the throttle wide open, however, the vacuum in the manifold is very low, and the valve will tend to seat itself. Then the perforations through which the gas mixture must pass act as an auxiliary carbureter, and by creating a higher velocity at this point they assist in the mechanical breaking up of the fuel.

As far as adjustments are concerned, the changes described do not entail any alterations. There is only one adjustment and this is on the auxiliary air valve spring.

# "Nerve" Is the Solution of the Used Car Problem

*Two "Lone Hand" Players Tell How They Have Made Profits by Indifference to the Practices of Rivals*

By CLYDE JENNINGS

**D**EALERS in automobiles are apparently engrossed in looking for a solution of two problems—Used Cars and Flat Rates. Both of these problems have been profitably settled by many dealers by a dint of hard-work and getting back to fundamentals. Scores of dealers are making a profit on used cars and maintenance, and thousands of dealers are standing on the sidelines, asking:

"How can we remove these terrible millstones from our necks?"

What is written here will have nothing to do with flat rates, but will deal with the used cars. In one respect, the problems are very similar. No one is ever going to settle either of them for the dealer. Each dealer will have to requisition sufficient intelligence and backbone to settle them for himself. It is a case, in both instances, of getting a proper grasp on the fundamentals of the business.

Two men who have solved the used car problem and are not afraid to say so, are Charles H. Emmons of Ashtabula, O., and B. B. Burns of Decatur, Ill.

Emmons will be remembered as the author of a letter which was printed in *MOTOR AGE* of March 1, which was perhaps the most astonishing document ever presented on the used car problem. Burns has just retired as president of the Illinois Automobile Trade Assn. He made so much money in used cars that he was requisitioned by manufacturers of Decatur to run their business for them. These manufacturers had watched his profitable progress in this much discussed business and considered him a good deal of a wonder. You cannot help but agree with them.

What follows here is taken from letters of these two men. Both of these men have been generous with their time and stamps in offering what help they could to their fellow dealers, but they express a common thought: That there is no help for the dealer who will not help himself and will not recognize the fundamental of merchandising, that proper buying is the first and only basis of profit.

Recently, Emmons was asked by the National Automobile Dealers' Association to supply data for the very illuminative survey being issued by that association. Emmons' reply, in part, follows:

"We are again filling out postal cards

showing our stock of used cars as per inventory of March 15th. As before, your card states, if any help is to be provided for dealers in handling used cars, you must have information showing how big the job is.

"I have come to the conclusion that there is no help possible for any dealer big or little who allows a used car problem to creep into his business, as there is no used car problem except what the dealer makes for himself. See letter written by me published in March 1st issue of *MOTOR AGE*.

"If any man is fool enough to pay good hard American dollars for an automobile and dispose of it for anything less than its value in cash, good notes or a used car at its real value as a piece of merchandise, there is no help for him, at least, if he does it more than once. And some dealers do it year after year until they deal themselves out of business.

"You might just as well admit first as last that the only cause of a used car or any other problem in this business is insane competition between dealers egged on by the factories by methods that, to say the very least, are shortsighted, such as over-stocking dealers by allotting cars regardless of whether the dealer can dispose of them at a profit or not.

"As long as dealers of a certain type are crazy enough to enter into this kind of competition, any help that you try to extend to them will be wasted, because, if they weren't giving their profits away trading, they would be doing it some other way. They would be lost without their alibis.

"The printer's ink that has been wasted on used cars would run a newspaper until I got religion. The wind that has been wasted in used car speeches would run all the windmills in the county and the used car problem stands today just where it did 10 years ago, the alibi for all the weak sisters in the business.

"You will notice that our used car inventory of March 15th was just exactly nothing. We sold 19 used cars since Dec. 15th and have a waiting list a mile long.

"If you are looking for information about a used car problem, you will have to go somewhere else, because we do not know what it is any more. We have passed through that stage of the business and are trying, with considerable

success, to make up the losses we took by trying to do business 'as she is did'."

Now, let's turn to Burns. Recently, Burns wrote to a correspondent in Pennsylvania who had asked that he pass along this mysterious secret. Burns says he has no secret, but merely did what he found necessary to promote his business. The difference is this:

The new car dealer sees profit only in the sale of new cars and lets the used car business take care of itself—if it will. Burns could not do this, so he made some rules for his own guidance. If Burns, as a free lance buyer, could get cars cheaper than the new car merchant, then he must have been a better buyer. This is what Burns wrote to the automotive dealer:

"Replying to your letter of March 7, in which you ask that I divulge the big secret of moving a large volume of used cars, wish to state that under present conditions, if I could really do this, I believe the fortunes of John D. Rockefeller and Henry Ford would look pitiful to me. However, I am only too glad to give you the benefit of the method which I think contributed most to my success:

**1st.** I did not sell new cars.

My stock was procured by outright purchase, which resulted in a better selection of stock and also in obtaining them at a better price.

**2nd.** The success of my business depended upon the sale of used cars only.

I was obliged to obtain the confidence of the public.

After obtaining this confidence, I was obliged to keep it by having satisfied customers.

To do this:

Practically all of my cars were put in good serviceable condition.

They were recommended only for what they were; that is, a Ford was not recommended to be a Cadillac.

They were sold on the understanding that a customer might not expect more from his used car than he would from a new one.

The customer was required to report frequently on the performance of his car.

If any unusual trouble developed, not covered by our warranty, we adjusted the matter satisfactorily with



FORM NO. 37		USED CAR APPRAISAL RECORD		No. 197	
OWNER'S NAME <i>Ed. Brewer</i>		ADDRESS <i>5341 Maffett</i>		DATE <i>2/2/22</i>	
MAKE OF CAR <i>Cakland</i>		LIST PRICE <i>1075</i>		YEAR <i>1918</i> MODEL <i>Running 34B</i>	
CAPACITY <i>5 Pass</i>		CYLINDERS <i>6</i>		MOTOR No. <i>368472</i> CAR No. <i>6419378</i>	
MILEAGE <i>31629</i>		SALESMAN <i>Art Nicklass</i>			
BODY & TOP	✓	Forwarded	67.00	Forwarded	103.00
Dents	✓	RUNNING GEAR		ELECTRICAL EQUIPMENT	
Doors	✓	Run, Board R.	✓	Starter (make)	✓
Cushions	<i>Bad</i> 5.00	" " L.	✓	Starter (cond.)	✓
Hood	✓	Fender RF.	<i>Bad</i> 10.00	Ignition	<i>New Points</i> 6.00
Curtains	✓	" RR.	✓	Battery (make)	✓
Paint, Body	<i>Bad</i> 35.00	" LF.	✓	Battery (cond.)	<i>Shot</i> 5.00
Paint, Chassis	✓	" LR.	✓	Head Lights	✓
Decks & Quarters	✓	Wheel RF.	✓	Side Lights	✓
Foot Boards	✓	" RR.	✓	Rear Lamps	✓
Tonneau Carpet	<i>Bad</i> 9.00	" LF.	✓		
		" LR.	✓		
		Wheel Alignment	<i>OK</i>	TRANSMISSION	✓
ENGINE		Rim RF.	✓	First Speed	✓
Main Bearings	<i>Loose</i> 5.00	" RR.	✓	Second "	✓
Con. Rod Bearings	<i>Loose</i> 5.00	" LF.	✓	Third "	✓
Pistons	✓	" LR.	✓	Reverse "	✓
Wrist Pins	✓	Springs RF.	<i>Broken</i> 6.00	Clutch	✓
Driving Gears	✓	" RR.	✓	Brake (hand)	<i>Refine</i> 10.00
Compression	<i>No</i>	" LF.	✓	Brake (foot)	<i>Refine</i> 8.00
Cylinders	✓	" LR.	✓	Rear Axle	✓
Crank Case	✓	" RC.	✓	Axle Housing	✓
Oil Leaks	✓	Tires RF.	✓	Drive Shaft	✓
Power	✓	" RR.	✓	Universals	✓
Carburetor	✓	" LF.	✓		
Radiator Core	✓	" LR.	<i>Bad</i> 20.00	EXTRA EQUIPMENT	
Radiator Shell	✓	" Spare	✓	Tools	✓
Valves	<i>Binding</i> 1.00	Frame	✓	Speedometer	✓
Spark Plugs	✓			Clock	✓
Distributor	✓			Dumper	✓
Idling	✓	STEERING		Shock Absorbers	✓
		Worm & Sect.	✓	Stop Signal	✓
		Ball Sockets	✓	Spot Light	✓
		Knuckle R.	✓	Power Pump	✓
		Knuckle L.	✓		
Forward	67.00	Forward	103.00	TOTAL	132.00
Remarks: <i>Motor had been gone over short time past</i>					
SUMMARY					
Total Cost Repairs \$ 132.00					
U. S. Appraisal \$ 300.00					
Allowance \$ 168.00					
APPROVED BY <i>F. H. Mary</i> APPROVED BY <i>J. M. George</i>					

the customer, as a part of our advertising and sales policy.

3rd. We warranted our cars to be as represented only.

"We paid particular attention to appearances, which were improved by painting, replacing top cover, fenders, running board covers, putting on seat covers, replacing isinglass, curtains, etc.

"In many instances we added numerous accessories, such as bumpers, motor-meters and side windshields.

"We oftentimes put on new tires and equipped with an extra tire and tire cover.

"Of course, the money expended on our cars required us to get a higher price for them than the same model and make of car could be procured elsewhere, but remember, we established a reputation for selling cars in reliable condition, cars that could be depended upon to give service, and, in addition to this, the appearance of our cars was always better than that of our competitors.

"We had many customers that we had won over from the new car purchaser class that refused to negotiate at all for used cars at any other place than ours. In fact, we believe that the public placed as much confidence in our product as they would in most of the new car establishments.

"It seems to me that there is just one

thing for a new car dealer to get into his mind and that is, if he expects to sell used cars he must handle them on the same business principle as his new cars and make for his used car department a reputation comparable to the one he makes for his new cars.

"Ordinary, recognized sane business methods will accomplish this. Of course, this would mean that he could not accept his used cars in exchange at any price above their market value. Any dealer can post himself on the market value of used cars. This would mean that he would be obliged to pass up home deals on account of the price asked by his customer for his used car. As to this matter, we were obliged to pass up any number of cars offered to us, because we could not agree on the price. Any article purchased above the market value cannot be sold in a manner to create public confidence and still make a profit.

"After the new car dealer has secured his used car he should be in a position to put it in a serviceable condition economically. If not, there is something wrong with his shop and it is well that he discover it. After it is put in serviceable condition, he shouldn't hesitate to recommend same to his customers, with the same enthusiasm as a new car. I know many new car dealers that readily admit that at the present market

value of used cars, there are many better values on the market today in used cars than the new.

"The prevalent method of most dealers of today wherein they advertise they are overstocked with used cars, they must have more room, they are house-cleaning, that the bank is pushing them for money, etc., etc., it seems to me is a very bad one. It was always our plan to advertise why the cars we offered were a good buy that there was more transportation and service in them for the money invested than they could possibly obtain elsewhere.

"There is another practice which we very much disfavor and that is, so many salesmen of used cars the minute they get the money or the contract signed for used cars dismiss the purchaser and the car from their mind as they would a bad nightmare and turn their efforts to the sale of another used car, making such statements as, they must go out and hook another sucker, etc., etc., whereas they should make every purchaser feel satisfied and continue to show a friendly interest in him and to attempt to make him a life long customer of the institution, which would enable the institution to increase its regular customers very rapidly in that they would be catering to a much larger list of prospects as it is readily conceded that the financial conditions will permit a number to purchase used cars that cannot think of purchasing new ones."

This sounds easy enough, the way these men tell it, but it has required some nerve to do these things in the face of the wild trading that was going on around these men by dealers who thought the 20 per cent on new cars would pay everything and then buy new dresses for the missus. Also it requires some organization in the plant. Neither Emmons or Burns say much about this organization, but it is there.

Accompanying this article are two forms that appear to be good record sheets for the used car department. One is a check sheet as a guide for buying the car. The other is a sales record, which will make it clear when the car is disposed of whether the dealer has made money on the car, or has played the hay rube act for some smart car owner. Both of these forms were devised by the Confort Printing Specialty Co. In addition the dealer needs tags to be put on the car while it is on display, stating the condition of the car so that the salesman will not go wrong and promise the buyer that it actually is the best car that ever took the road.

Now get back to Emmons. In another letter he says:

"On January 1st, this year, we stopped selling cars (as is). We rebuild them and sell them with a full guarantee at a profit. Here is a record of one car taken at random from the bunch.

Used Maxwell 1921 Model.	
Trade in allowance.....	\$215.00
Parts .....	63.30
Labor .....	59.50
Paint .....	45.00
	\$382.80



"Resale price \$485.00, making us a profit of \$102.20 to do business on and service the used car. We find that the service on a used car properly rebuilt is less than the average new car.

"When I put this policy into effect I was told that it would put us out of business. That the guaranteed used car would break us up. And that I would be unable to get the used cars at my price. My answer was that I was sure to go out of business the old way and I was going to try to mix a little common sense in my business and see if it wouldn't work.

"The result has been that I am absolutely sold out of used cars. On March 15th we haven't a used car in the place that is ready for sale. And we are doing the best new car business we ever did. Of course to do this we had to have something besides cars to sell. We had to have a reputation for square dealing and first class service. The highest paid man we have is our chief mechanic. We had to shut the outside car out of our repair shop because some people went other places to pick up a bargain and brought their car to us to do the work on it. Now we will not work on a car unless we sold it. The only exception to this rule being to tourists. We give them the best in the shop to help them on their way."

There is one other used car plan that is working very successfully for those who have tried it. That is the application of the Cole plan of "no trades." This plan was recently officially adopted by the New York Automobile Merchants' Association. This plan is, in brief, that the dealer does not put any money into the customer's car at all, but becomes a sales agent for it.

The dealer appraises the car that the customer wants to trade in, and stands ready to guarantee the car as being worth this price. He accepts a note for the value represented by this appraisal as a part purchase of the new car, less a 10 per cent commission for selling the car. Thus, if the car is appraised for \$500, a note is taken for \$450 and the car is put on sale for \$500 if the customer is willing. If the customer insists, the car will be put on sale for \$750 but such an overprice lacks the punch as the dealer is only willing to pledge his judgment as to a worth of \$500.

The Cole Motor Car Co. of Chicago is working on this plan and President Silver of the company says it is working out beautifully, both as to new car sales and to used car sales. Also, he says, his maintenance department has been able to get some nice jobs from this arrangement. His shop is on the flat rate plan and when a car is appraised, the owner is told just exactly what is required. He is told that if this work is done, the car value will be increased from \$500 to \$750 by spending \$150 on the car. Perhaps the owner of the old car backs the speculation, perhaps he does not. If he does not, a notation is made and the same proposal is made to the buyer of the used car. Nearly

FORM 36 Correct Printing Machinery Co. St. Louis, Mo. (See page 100)		USED CAR RECORD	
FIRM NAME		LOCATION	
RECORD NO. 18	DATE ENTERED Oct 30-1920	BY A.M.E.	
PURCHASED FROM Wm. Conway			
ADDRESS 85 Fairchild Pl.	CITY St. Louis	STATE Mo	
MAKE OF CAR Valie	TYPE Roadster		
ENGINE MAKE Continental	ENGINE NO. 981463		
CAR NO. 36784	MODEL 1918		
LICENSE NOS. 103-591 Mo	CITY 7922 St. Louis		
DATE PURCHASED Oct 29-1920	CASH Yes	TERMS	
REMARKS Made State transfer			
COST RECORD		SALES RECORD	
PURCHASE PRICE 480.00	TOTAL COST 575.00		
OVERHAULING 35.00	DEMONSTRATION EXP. 9.50		
REPAINTING 50.00	SELLING EXPENSE 23.50		
ADDITIONAL EQUIPMENT 12.00	PROFIT 166.00		
TOTAL COST 575.00	SELLING PRICE 744.00		
SOLD TO Chas. F. Davis		DATE	
ADDRESS 3149 Shenandoah	CITY St. Louis	STATE Mo	
TERMS 274.00 Cash, 1 note 200.00 pay Jan 15-1 note 200.00 pay Feb 15-1 note March 15-100.00-6% Int.			
GENERAL REMARKS Car in excellent condition Overhauled Generator and bored cylinders			

always, the maintenance department gets the job from either the seller or the buyer of the used car.

The only drawback on this plan is that,

like those proposed by Emmons and Burns, it requires nerve to put them into execution while one's neighbors are working without any plan at all.

## 23 Years Ago This Week In Motor Age

(From MOTOR AGE of April 19, 1900.)

### The First American Motor Race

NEW YORK, April 15 (1900)—America's first automobile road race was in every particular successfully run over a fifty-mile course on the famous Merrick road on Long Island yesterday morning.

A. L. Riker, mounted on the five horsepower electric racing wagon, which was specially built to carry him in the Bennett International Cup race in France on June 14, won by a quarter of an hour in 2:03:30.

S. T. Davis, Jr.'s four and one-half horsepower steam Locomobile, which made the fastest time to the turn at 25 miles, was second in 2:18:27.

Alexander Fischer, by masterly handling of his five horsepower gasoline runabout, built by the Automobile Co. of America, landed himself in third place in 2:30:01.

American road competition records were established by Riker and Davis at 50 and 25 miles respectively.

There were 15 entries and nine starters—one electric, three steam and five gasoline. Eight rounded the turn at 25

miles and seven reached the finish at 50 miles.

C. H. Tangaman of Brooklyn, mounted on an imported DeDion racing tricycle, went over the course as a free lance, starting with the first auto off. He covered the 25 miles in 52:48 and the 50 miles in 1:57:48.

### American DeDion Company

NEW YORK, April 13—Kenneth A. Skinner, who controls the DeDion Bouton Motors for this country, has been in this city several days promoting a company for the manufacture of the DeDion motors for sale in the open market.

### The Locoracer

WORCESTER, Mass., April 14—The Locomobile Co. of America has completed in its Westboro shop, a new pattern of steam carriage which has been named the "Locoracer." The carriage was designed by T. F. Ahearn for speed work. It is similar in pattern to the regulation Locomobile, but is lighter and has three-quarters seats. Over rough roads this week the machine covered the distance from Westboro to Worcester, city hall, fourteen miles, in 37 minutes.

# "The Dumb-Bell" Was "The Lucky Dog"

*Yeh Jim Was a Poor Fish All Right  
He Was N. G. at Kelly Pool  
But  
Through Dumb Luck He Sold a Lot of Cars*

By ROY FAULKNER

Salesmanager, Auburn Automobile Co.

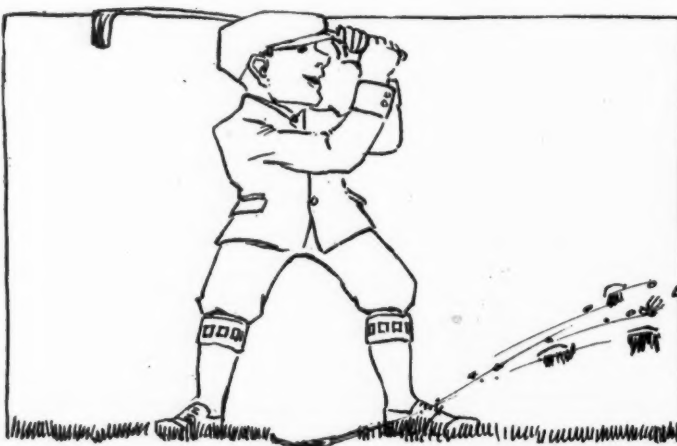
JIM JONES was a lucky dog. Yeh, he wasn't much to look at, and he wouldn't have created a panic, if he'd posed as an Arrow collar ad, but all the auto salesmen agreed he was lucky, when they met at the bowling alley.

He was just naturally dumb; he didn't know whether Morvich was a horse or a Russian general,—but he made \$9,000 last year selling . . . cars on commission. Of course, he played a rotten game of golf and was an awful frost, when it came to kelly pool, but just through dumb luck, he sold a whale of a lot of cars.

He was a funny bird. Every morning he would get up, even though he was working on commission, and beat it to the office, so that he'd be there by eight o'clock and have his daily report made up and ready when the meeting was called at eight-thirty.

He had a peculiar way of making up his work sheet the night before, and arranging his days, so that he didn't call on one man in the south end of town about nine-thirty, and then make his second call at eleven in the north end. He used to make up his list so that he could see at least eight to ten people every day.

The other boys couldn't worry with more than six, and still find time to read the newspapers, and take two hours for lunch. It was impossible.



"Of course he played a rotten game of golf—but he made \$9,000 last year selling cars on commission"

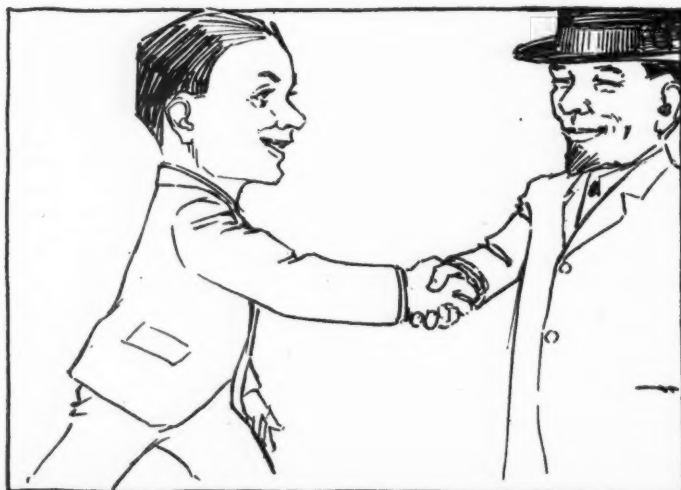
Jim had an odd type of mind. He would waste his spare time in the evenings getting acquainted with chauffeurs and small garage men, when he might have been practicing and learning to be the greatest pool player in town. The boys that used to hang around the street corners, and loaf in Tony's didn't like him, but somehow all the chauffeurs and small garage men knew him and liked him, and when a fellow mentioned that he was going to buy a new car, they just naturally went to the phone and called up Jim.

Maybe, he was enough of a nut to give them a new hat or ten or fifteen dollars, if the sale went through, and he made a commission of sixty or seventy. The boys used to sneer about him, and say he bought his business, but he was queer, and always thought is a good idea to spend one dollar to make three.

His wife was just like him. It was a good thing she married him, and they didn't spoil two families. She always thought his business was more important than her pleasure—and she never would complain when he got held up by a prospect and didn't get home for dinner until seven-thirty. She ran sort of a quick lunch counter for Jim, and he was sure of a hot meal no matter when he got home.

Jim had the letter writing habit bad. About a week after he sold a car to a man, he'd write a crazy letter like this:

"Of course, I am out most of the time trying to develop new sales, but I want you to feel that I have not forgotten the



"He had a genuine kind of a smile and somehow, when he shook hands with you, you felt he was really glad to see you"



"Jim had an odd type of mind. He would waste his spare time getting acquainted with chauffeurs and small garage men"



fact that you are one of my owners, and I want you to call upon me at any time I can be of service to you.

"Sometimes there are a few little misunderstandings between the customer and the service station, and as I established the first point of contact between you and the Smith Motors Company, I will appreciate it if you will get in touch with me personally whenever necessary.

"I am extremely anxious to have you satisfied with your purchase of a....car."

His customers seemed to like these letters but the boys all figured them as bunk and a waste of time. But it sure was weird the way Jim's customers stuck to him and handed him prospects. He had another silly way of impressing his name on prospects. He'd call on a man, and about five days later, he'd send him this letter:

"My dear Mr. Smith:

"My name is Jim Jones and I sell.....cars.

"That may not be interesting to you, but it means a lot to me. You are one of my prospects. If I worry you to death—you won't like me. If I don't worry you, you'll forget me. So I am writing you this letter. It isn't much of a letter as letters go, but if it makes you remember Jim Jones and.....cars, it will serve it's purpose.

"Please don't forget me, as I am coming in to see you again soon, and tell you some more interesting reasons why you should buy a.....car from

Yours very truly,

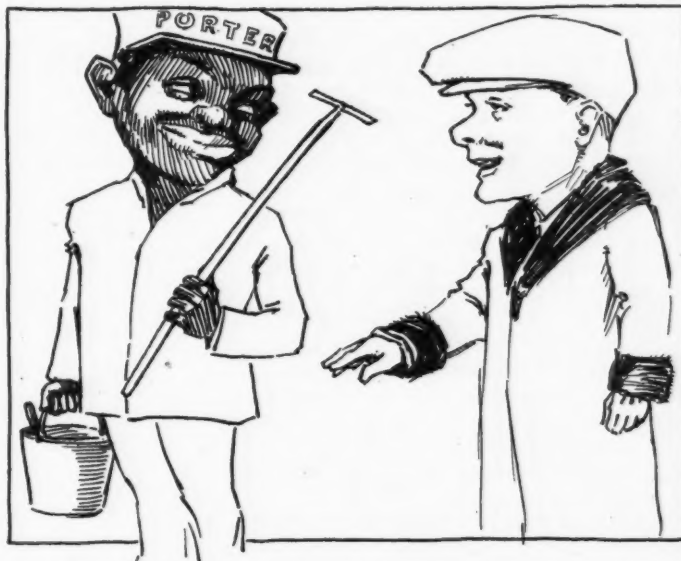
Jim Jones,"

Silly letter— isn't it? But the prospects just sort of remembered Jim Jones and the.....cars.

He used to think that the colored porters were human beings, and bring them down his old clothes to work in. I believe there wasn't a morning that he didn't go out through the back, and give them a smile and a cheerful remark, and dumb as he was, he always seemed to remember the nice little things he heard about people like the mechanics and porters.

When one of his customers told him something nice about the service he always took time to go up and tell the service manager about it, and he always took his customers up and introduced them to the service manager, whenever he delivered a car. Of course, this took time, but of the whole gang in the salesroom, he seemed to be one who could get the most out of the mechanics and porters. I guess maybe, he sent their kids candy at Christmas or some crazy thing like that, that didn't mean anything, and cost him as much as ten or fifteen dollars.

God didn't make him an Apollo, so Jim did the best he could with what he had to work on, and kept himself neat and clean. Somehow, he always seemed to be able to stand on his



"He used to think the colored porters were human beings"

feet, and never leaned all over the fender of a car when he was talking to a prospect. He seemed to get just as much enjoyment out of a cigarette smoked out in back, as he did one smoked on the salesroom floor, when the boss happened to be out.

He had a genuine kind of a smile and somehow, when he reached out his hand, and shook hands with you, you felt he was really glad to see you. Of course, it might have given him a lot of satisfaction to get moody and nasty, when things didn't go right, but he just sort of kept his nastiness to himself.

Whenever Jim wanted anything done by one of the porters or mechanics, he always said, "Will you please do this or that?", when he might have ordered them to do it just as well as not.

On his floor day, if things were sort of slow, he used to call up his customers, and ask them how their cars were performing instead of loafing around, having a lot of fun kidding the girl at the information desk. He missed a lot of fun.

Yeh, Jim was a poor fish all right, but he made \$9000 last year, and figures that he'll make more this year. He thinks selling motor cars is just like selling soap or lumber or anything—you put in a lot of consistent effort for a good return—and then of course, as I said before, he's just naturally lucky, and business falls into his lap.

## Dan's Diary

**A**PRIL 19—There wasn't much doing around the shop today, even if it was Satiday, being cold and wintery and no joyriders was out burnin up gas and oil and punthcering their tires, so I has it pretty soft.

April 16—If i has it soft Satiday i certainly got it thrun into me Sunday cuz its the 1st warm Sondag we has had and every piker in the country was out tryin to see how much damage he could do to them old busses that had been tied up in the stall all winter.

All them old tires that has been flat on the floor with the rims bearing down hard on them just naturally busted open when they got good and warmed up and a little extra pressure inside and Me and the hurry-up wagon was on the run all afternoon taking new tires to guys that didnt have no spare.

The boss had to get on his overhaws and take care of jobs in the shop and i gess he aint so much stuck on it judging by the way he cussed around and looked



all plaid out wen night come.

He outa felt pretty good cuz he made a barel of jack but sum guys aint never satisfied. If they can make a lot of jack working hard for it then they want to get some other guys to do the work so they can stand around and be swell with a segar stuck in their face and crackin jokes with customers only they never wants to pay the other guys their share for doing all the dirty work. Instead working themselves to git bizness enuf to keep a lot of fellows busy they just want to charge the customer enuf to pay them and the man both for doing 1 job them doin all the sitting around.

## FRONTENAC IS BANKRUPT

INDIANAPOLIS, Ind., April 16—The Frontenac Motors Co. has filed a voluntary petition in bankruptcy in the Federal court here. The petition, signed by Louis Chevrolet, president of the company, lists assets at \$425 and liabilities at \$88,163. The chief creditor is W. N. Thompson, president of the Stutz company, whose claim is given as \$49,700. The balance of the liabilities is made up of rents, advertising advances, services and other bills.

This is the original Frontenac company, organized in 1915, in Michigan. The Frontenac company, organized later by Allan Ryan, which was dissolved, was to have taken over the old Frontenac company, but this deal was never consummated.

## STATE BUS ASSOCIATION

INDIANAPOLIS, April 14—Bus owners of Indiana are to meet in this city April 17 to organize a state-wide bus association.



## How to Make Use of an Ignition Tester

FREQUENT enquiries received by the Clearing House dept. of MOTOR AGE indicate that methods of testing ignition coils would be of interest. The following article published in the May 4, 1922, issue is accordingly reprinted.

For a spark gap we have shown the porcelain and center electrodes from a spark plug used as one side of the gap while the center electrode only from another spark plug is used as the grounded side of the gap. You will notice that the grounded side of the gap is mounted on a pivoted support so that the distance across the spark gap point can be varied by swinging the arm around the pivot. If connected as shown no shock will be obtained when moving this grounded support. The interrupter that we have shown on the test board can be any interrupter that is available. For example, a Connecticut, Remy, Atwater Kent, Wagner, North East, or any similar type can be used, although it would be preferable to use one that does not have a condenser built in it. If you have available an interrupter that has a condenser in it, it could be removed and used for the spare condenser as shown in the upper part of the test board.

At the left side of the test board there is shown an ammeter and a battery switch although these could be eliminated if so desired. In this case the interrupter should always be left with the points opened when it is desirable to have no current flowing.

The trick in using any ignition tester is in properly connecting the coils and as far as we know there is no ignition tester made that can be operated by a man who has no idea of ignition systems. In Fig. 1 we have shown the ignition tester connected up to a Remy coil and in this case the trick is to connect the test board terminal marked in-

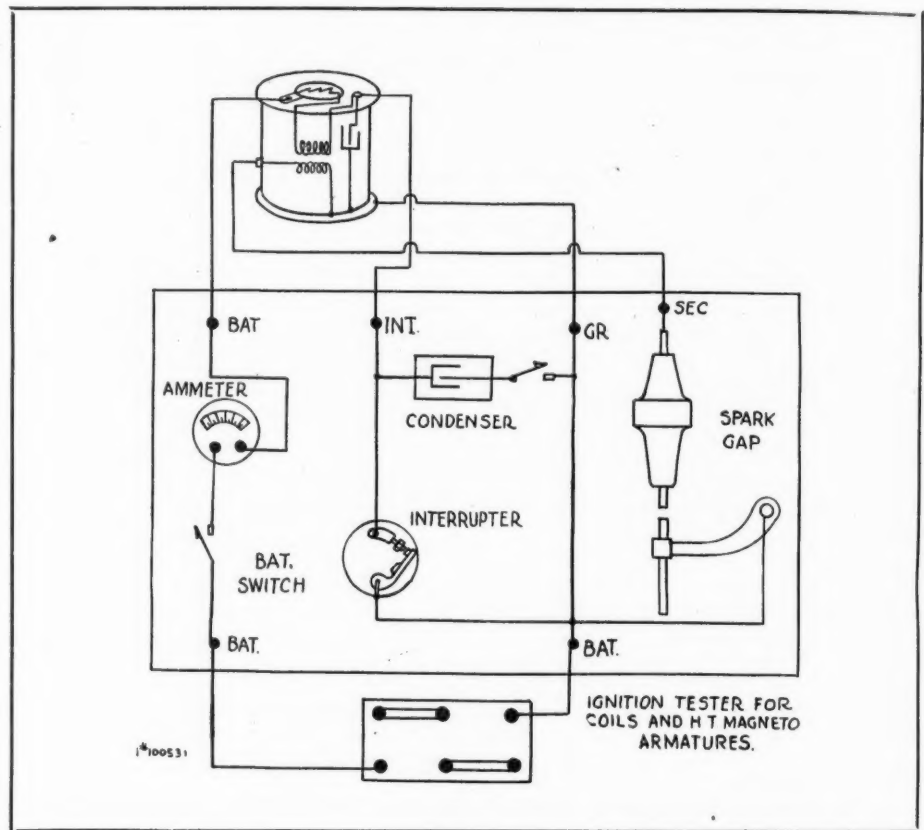


Fig. 1

terrupter (Int.) to the common terminal which serves both the primary winding and the condenser. The other end of the primary circuit goes to the Bat. terminal on the test board while the base is connected to the Gr. terminal which serves both the condenser and the ground end of the secondary.

The live end of the secondary is then connected to the Sec. terminal on the test board which carries the high tension spark to the spark gap. In the

construction of the test board it would be possible to drive the interrupter with an electric motor or a wheel and handle could be put on so that it could be turned by hand or if high speed is desired perhaps a 1 in. pulley could be put on the interrupter shaft and 8 or 10 in. pulley belted to it so that turning the large pulley gives high speed to the interrupter.

It will be found, however, that operating the interrupter at a fairly low speed

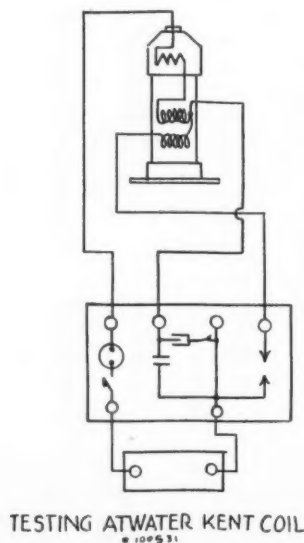


Fig. 5

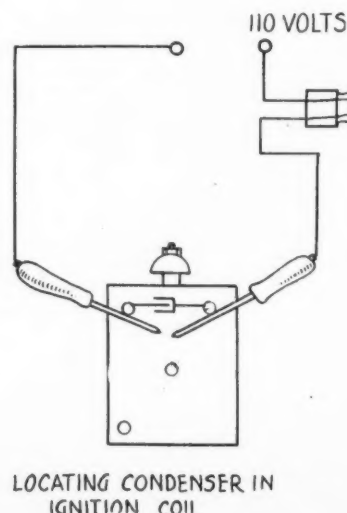


Fig. 2

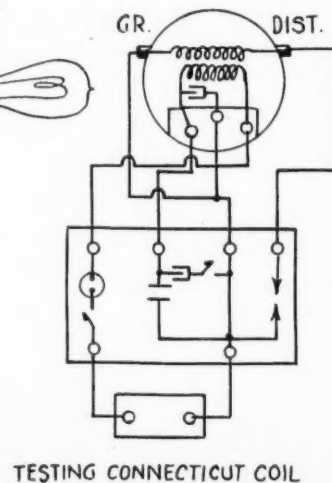


Fig. 3

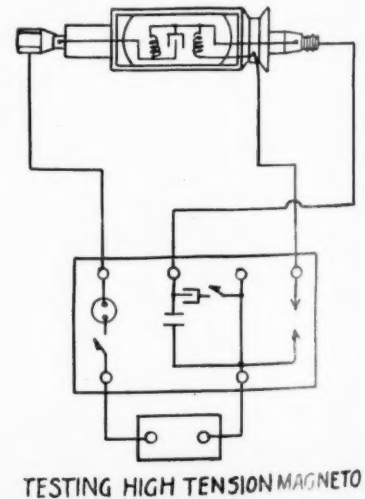


Fig. 4

will check the ignition coil better than at high speeds, as it is easier to tell whether the sparks are missing or not. To test an unknown coil the first thing to do is to find out what is inside of the coil and in Fig. 2 is shown a method of locating a condenser in an ignition coil. When the condenser is found, the proper terminals will be those through which no current will flow as indicated by the lamp failing to light. However, as the test points are kept as shown in Fig. 2 and gradually slide along the terminals, until the points touch together there will be a snappy spark at the tip of the test points which indicates that the condenser has been located. Should the condenser location be known, however, and the lamps light up through the condenser it would prove it to be punctured and would show that a new one was required. After the condenser

has been located the primary circuits should be found and this can usually be determined easily by the appearance of the coil or by the terminal which gives a good circuit as shown by the lamp lighting up. Another way to test for the primary circuit is with a 6-volt battery and an ammeter an ordinary 6-volt closed circuit coil drawing approximately 5 amperes. After the internal circuits of the coil have been figured out it will be found that there is always one common terminal which is serving both the primary circuit and the condenser, that is, when the coil includes a condenser. This terminal should always be connected to the Int. terminal on the test board. The other end of the primary circuit should go to the Bat. terminal, the live secondary should go to Sec. on the test board and the other end of secondary and condenser should go to

Gr. terminal. In Fig. 3 will be seen the method of testing Connecticut coil which is based on the above principle. In Fig. 4 will be seen method of testing a high-tension magneto armature. In this case it is impossible to get the condenser in the armature properly connected with respect to the interrupter on the test board so that with the condenser switch opened, fair sparks should be obtained at the spark gap and with the condenser switch closed the sparks at the test gap should be improved. When ignition coils are being tested the general rule is to leave the condenser switch open when a condenser is in a coil and close it when there is no condenser. For example, in Fig. 5 the Atwater Kent ignition coil having no condenser it is necessary to close the condenser switch to get proper results.

## What Six Owners Call "Service"

### 2. A Salesman

**B**ELOW is printed an interview with a Chicago salesman. He is one of many car owners who have the same or similar opinions of the maintenance business. He is, in fact, typical of the average American car owner. What he says here is what most will say about the service shop.

The reason for it is, lack of maintenance education. This, possibly, is due to the dealer with whom he should be doing business, or again, it may be the fault of another influence. This "other influence" is the alley repairman with whom the man has been dealing. In the last analysis, it is the fault of the dealer **WITH WHOM THIS CAR OWNER SHOULD BE DOING BUSINESS.** The alley repairman with his secretive shop has given him the wrong impression and the mediocre grade of work turned out in the alley shop has disgusted him.

When we say that this man is typical of many owners, we mean, that the dealer has just this sort of resistance to meet in his maintenance department. He must correct this impression by better service. A visit to the dealer's place of business should convince this owner that "everything will be all right." Further than that, everything **MUST** be all right when the man takes his car out, or, if it is faulty, it should be carefully and cheerfully made good.

"I use my car every day, winter and summer," said H. L. Shell, salesman for the Harper-Kirschten Shoe Co., Chicago, "and, since 1918, it has given me good transportation. The car is a 1916 model but still is in fine condition mechanically. I believe this is partly due to the workmanship in the car originally and partly due to the service workmanship that has gone into it since it came from the factory.

"It has cost me plenty during the while I have driven it but unless I felt that it was paying for itself, I would not now be using it. It is easy on tires—at

least I have had little trouble with the rubber on it. In the winter, it runs just as smoothly and easily as in the summer—this again I attribute to the fact that I have been taking it to a real service station.

"But you ask it I have noticed anything wrong with the service station business. Indeed I have. A garageman often whines about the opinion people have of him because of someone else. He thinks he is doing the right thing but he is sure that the other fellow down the street is not on the square and as a consequence he is losing business. It is my opinion that if garagemen would go on and mind their own business, do the right thing by their customers, they would have little to complain about.

"I have often wondered if the shop of many of the garages I have entered is a secret torture chamber for cars or what. There is no other business that has so much secrecy attached to it as the automobile repair shop. People can go through a clothing or shoe factory and ask questions of workmen and get an intelligent answer, but those few automotive repair shops that do allow people to enter the shop seem to employ the dumbest fellows they can lay their hands on.

"This is not a rap at the mechanics but at the employers. If a man cannot tell you what a certain machine is used for, is he fit to use that machine on your car? If a garageman refuses to let you into his shop, why? It can hardly be wondered at that people regard garagemen as 'gyps' and 'dumbbells' when you consider this.

"Just recently the distributor of the car I own closed his shop to visitors and for that reason, I have quit taking my car there. I want to see what is being done to my car and know what I am paying for. I also want to see that I get what I am paying for."

(The distributor that Shell speaks of here is one of the best known on Chicago's row. He has one of the best equipped service stations in the country and since the closing of the place to visitors, Shell has been taking his car to an alley repair man.)

"It would seem to me that some repairmen are afraid you might learn how to do some things yourself and in that way deprive them of the business. This veil of secrecy is what I don't like about garages. If a man cannot show me what he is taking my money for, then he is not going to find it so easy to take that money.

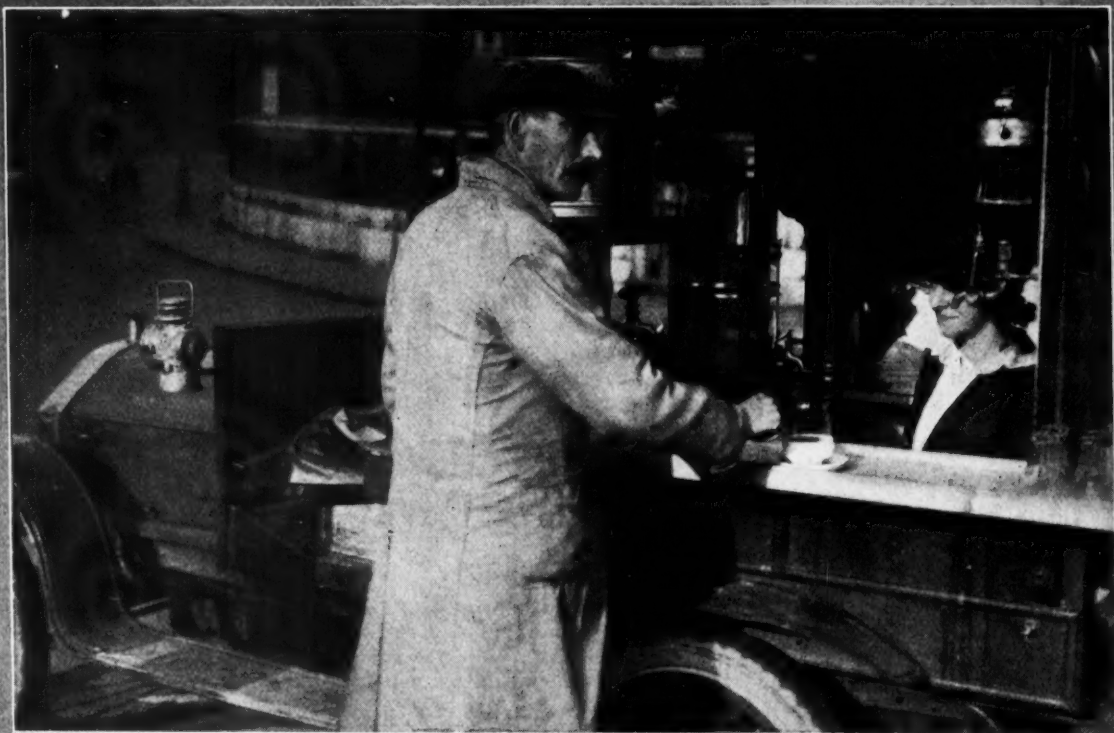
"A few months back, a fellow out near my office took down the starting motor on my car and when he had it laid out on the floor, told me that it wouldn't be worth while to have the thing fixed—I would have to have a new one installed. He charged me for taking it down and the next day, another man fixed it at half the first one charged me for the labor alone and didn't say a word about it not being worth while. The motor has given excellent service since.

"Why do these men do such things? They may soak the car owner once in a while but in the long run, they get the worst of it.

"What I have been trying to say since I started is that regardless of what you are, who you are or where you are, 'honesty is the best policy' if you intended to stick-it out. Some day, garagemen will wake up to this and then, service departments will begin to pay them handsome incomes."

The secretive fault that Shell refers to is not in the shop but in the lack of better merchandising. If the dealer would sell his customers on past performances of his service department and on the equipment in it, there would be less of this kind of talk of the service station.

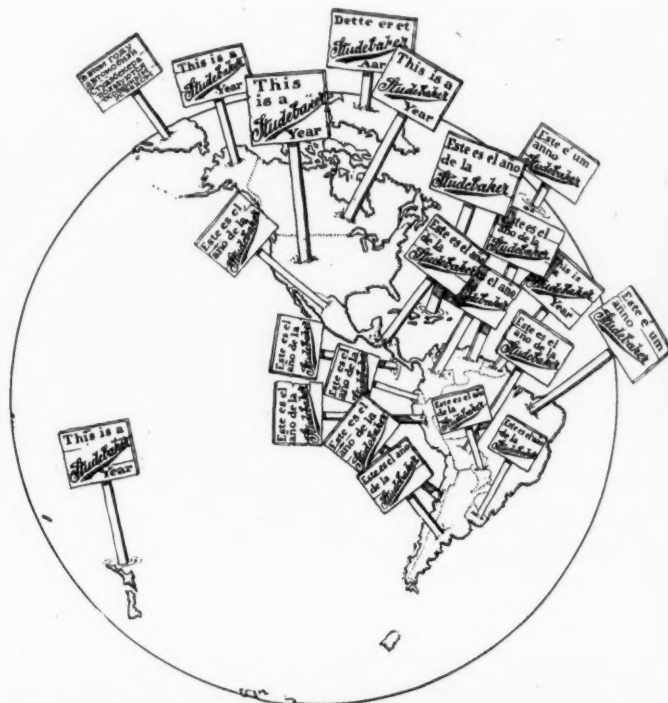
# MOTOR AGE'S PICTURE PAGES



*This automobile coffee shop, which stands in the shadow of the Houses of Parliament, in London, England, is one of the city's most democratic institutions. It is patronized not only by the passing laborers and clerks, but also by dignified Members of Parliament on their way home from late sessions*



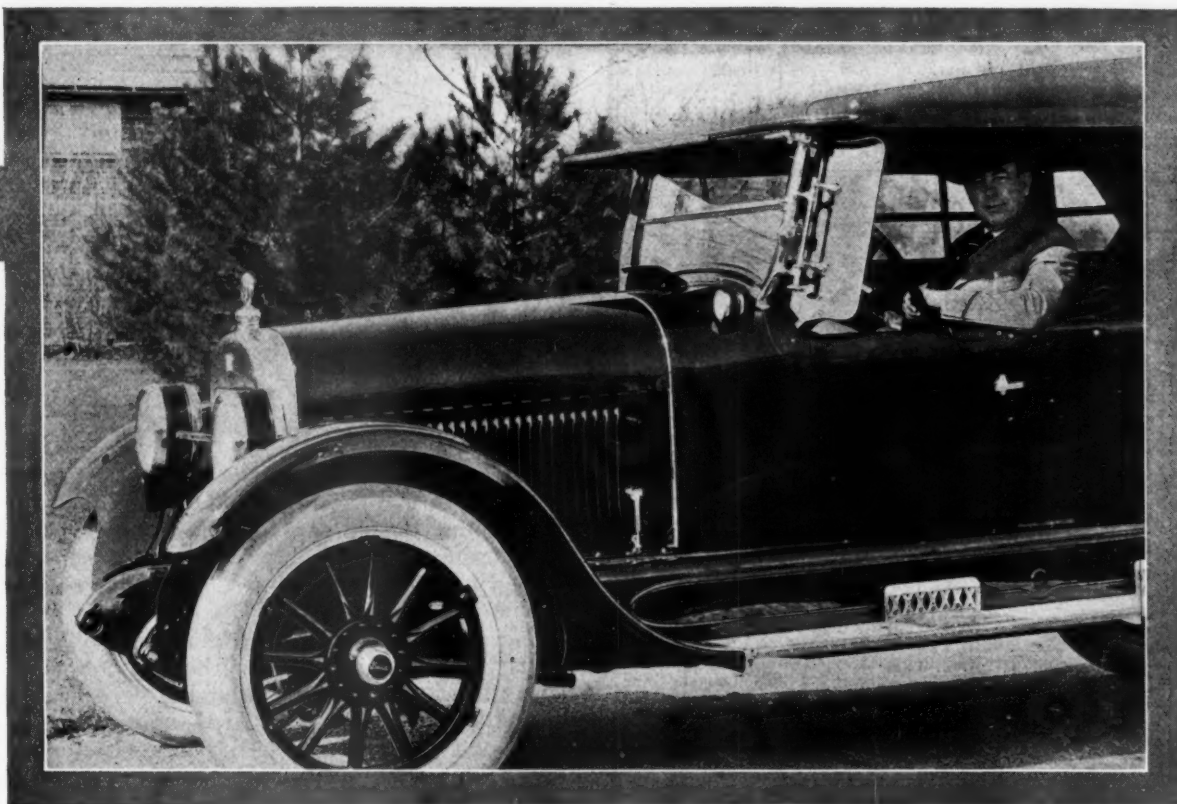
*No, Jackie Coogan doesn't drive this car—his legs aren't long enough yet—but it is his own and he takes great pride in keeping it "nice and shiny." This Buick sedan was given to Jackie as a reward for finding a name for his latest picture. Jackie suggested calling it "Daddy"*



*A new and unusual sort of poster is being displayed in the showroom windows of Studebaker dealers everywhere. The idea behind this poster is to illustrate graphically how the Studebaker slogan, "This is a Studebaker Year," has traveled around the world*



# OF AUTOMOTIVE INTEREST



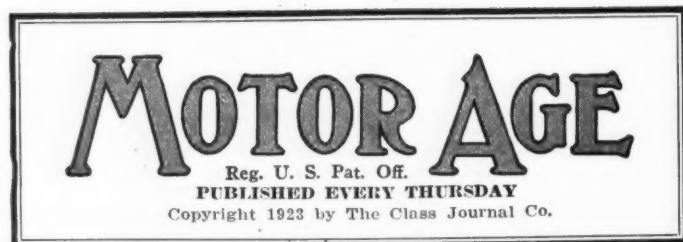
General Sales Manager E. T. Strong, of the Buick Motor Co., at the wheel of the car bearing the serial number which indicates that it is the company's millionth car and so distinguishes the company's twentieth anniversary



The poster shows two maps, of the eastern and western hemispheres, in colors. Arising from each country is a sign post, there are 52 of them in all, bearing the slogan, "This is Studebaker Year," in the language of that country



Dr. H. T. Royce, of Ormond Beach, Florida, believes that his prize airdale, "Prince," should be allowed the pleasure of motoring, so he constructed this special compartment for his pet and "Prince" gets some great rides now whenever the doctor drives



Vol. XLIII

Thursday, April 19, 1923

No. 16

## THE CLASS JOURNAL COMPANY

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### SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....\$3.00 per year  
 Canada.....5.00 per year  
 All Other Countries in Postal Union.....6.00 per year  
 Single Copies.....35 cents

Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

Member of Associated Business Papers, Inc.  
 Member of the Audit Bureau of Circulations.

## Clean Up

THE Department of Merchandising of the Automotive Equipment Association is backing a national cleanup of automotive sales institutions on May 1. The idea is a good one and every association, distributor, jobber and dealer should join in boosting the movement.

It has been a very general, and perhaps well deserved criticism of the automotive shops, that they were not as clean and attractive as they should be. This criticism seldom holds against the dealer establishment that actually sells cars, although it is likely to hold against the shop that this man runs in connection with the white tiled salesroom.

It would raise the estimate of the automotive stores and shops immensely if they were all as clean and bright as the merchandise they sell. Many a gas and oil dealer has stood lonesome on his untidy corner and wondered why all of the drivers went to the place on the next corner. The reason probably was that the next corner oil station was bright, well painted and the unneeded space was planted to flowers. Brightness attracts even those who ignore the condition of their own dooryards.

The clean up idea advocated by Arthur R. Mogge

as his first move since taking over the Department of Merchandising, will be well advertised through jobbers and their salesmen and should come as near reaching every sales institution in the country as it is possible for any movement to reach, especially if it is supported by associations and car distributors, factory branches and the like. It has an excellent foundation for becoming a national movement and all should help it. MOTOR AGE hopes that all will take hold and push this move of Mr. Mogge's to as near 100 per cent clean up, inside the shop and out, as possible.

Stickers and literature with which to boost a campaign can be obtained from the A. E. A.



*The test of goods is the house behind them.*



## Vehicle Prices

EVERYBODY appears to be greatly interested in the future car prices. Dealers are rather excited about the rumors that the vehicle they sell will increase next week, or the first of next month and they are very hopeful that the rumors that competing cars will be increased are true.

There is much news from the supply market that appears to support the idea that a good many persons have that vehicle prices must be increased in the near future. There are statements appearing in publicity and news that indicates that a good many manufacturers are thinking seriously of increasing prices. News items appear in the newspapers from day to day that this car and that has been increased in price. Then come the denials.

Some increases have been announced with as little fuss as possible. These increases have been in the main on the open models which are the most competitive of the models. While this is being done, some statements given to the public feature the high price of plate glass as one of the strong reasons for a possible reason for increased price. It is no secret that there has been more profit for factories in enclosed models than in open cars. So these statements only add to confusion of thought.

When you read the statements of the actual heads of the great manufacturing plants, you find that there is a strong opposition to an increase of prices at present. These executives do not want to muss up the best selling season they ever had with buying barriers. The sentiment is all against an increase and if it comes, it will be because these executives see ruin at present prices. The only thing the dealer can do is to wait and hope.

It is at least to be hoped that if price changes are necessary, there will be a clean cut announcement of the reasons that have brought them about.



*The often penny is often greater than the seldom dollar.*



## Clerk or Salesman

IT IS interesting to hear salesmen talk. It is also interesting to note the distinct contrast in what they say about their jobs. There are two distinct types: one the clerk in an automobile store, the other a salesman who believes that he is in business for himself. The clerk type is the man who regards his day on the



floor as his greatest privilege. He expects there to pick up the tips that will enable him to sell cars. On the days he is not on the floor, he calls on the persons whose names he has obtained on the floor and goes around to the salesroom expecting the sales manager to hand him out some trips. Often the sales manager, in order to hand this man something to keep him busy, will have a typist copy a lot of names out of the telephone book, or look up a list of car buyers several years old, or something of that sort. This clerk type acts as though he was paid by the company to become some sort of an errand boy, and he seldom thinks for himself.

The salesman type is the man who looks out for himself. He believes that in giving his time to this particular car he is making a very heavy investment and that he must get out of it all that he can. He looks up influential owners of this car, interviews them and urges them to sell cars for him. He picks the dead ones from the live ones and works only on the live ones. He takes the attitude that he is in business for himself and that as he is working on a very small percentage of profit, he must work fast and give a close accounting of his time to himself. He regards days on the floor as more or less of a check upon his activities and believes that in going from office to office he can gather more prospects and selling points than by sitting at a desk, looking into space and waiting. This is not the sort of a man who smokes at the front windows and comments on the girls who pass.

Mr. Dealer, are you making clerks or salesmen of the men who assist you?



*How do your employees that meet the public impress the public?*



## How Maintenance Develops

RECENTLY some persons who have not before been interested in maintenance have awakened to the fact that maintenance is a very large industry and that it has not entirely found itself, when compared with the production systems of the automotive factories. But these recent converts to the fact that maintenance is a big industry and is growing faster than the manufacturing industry, have made the mistake of assuming that maintenance is making no progress.

Some of these men have gone so far as to say that the only hope for maintenance is for the factories to take the situation in hand and straighten it out by some magic command. In this, they are not agreed with the men who have maintenance as an every day thought. Here is what Harlow N. Davock of the Packard Motor Car Co., writes in a recent statement prepared for Automotive Industries:

"With a flat rate system in operation the factory is enabled to get many valuable tips on economies from dealers, because it promotes an experimental spirit. Where any dealer succeeds in making an improvement in time or labor saving methods it is passed on to the factory and, if satisfactory, is adopted through the entire sales organization. Factory engineers and service experts are constantly engaged in seeking improved methods but the help supplied from dealers is extremely valuable."

This is as MOTOR AGE sees the development of maintenance. Few factory service managers will even claim to be the final authority on all of the questions that arise in the maintenance of the cars. All factory service managers are constantly in touch with their dealers and are gathering in ideas, testing them and passing them on.

The great laboratory that is making a greater and a better maintenance industry is in the better class of well equipped maintenance shops, and there is a constantly increasing number of these. May the good work go on.



*The show window represents one-third of the total rental value of a store. Does your window pay its way?*



## Extension and Revision of Specification Tables

EXTENSIONS and revisions have been made in the specification tables which appear weekly in MOTOR AGE and, beginning with last week's issue, the following holds true:

All companies which are local assemblers have been omitted and it will be noted that the tables herewith comprise vehicles which have a national distribution.

In the passenger car tables, coupes, sedans, etc., are listed under the heading Closed Models, with three options of seating capacity. The body types have been designated according to the seating capacity.

In the Motor Truck tables there now are two instead of three columns per page. This has been made possible by eliminating the local assemblers. Also to these tables has been added the make and model of engine, make of clutch, make of gearset and make and model of rear axle. The Canadian trucks have been placed together at the end of the table.

The tractor tables now include the recommended plow capacity, diameter and face of belt pulley, diameter and face of traction members, type of final drive and weight. Garden tractors have been placed at the end of the table.

We believe this arrangement of the tables will make them even more useful to our readers than they have proved in the past.



*Selecting the right jobber is just as important as selecting good mechanics.*



## A Used Car Outlet

A FEW days ago, a Chicago man who is a part of the automotive industry went to a piano store to buy an expensive piano. One of the early questions asked of him was if he had a piano to trade. He replied that he did not have, but that he had a couple of automobiles that he might offer.

Immediately the salesman began to talk on a trade basis. The deal is not yet closed and we merely offer this suggestion to automobile dealers with the thought that they may be able to suggest a new outlet to some of their customers who put a high value on their used cars.

# Few New Laws to Annoy Industry

## 25 Out of 43 Legislatures Have Ended Without Harm

### Some Gasoline Tax Bills Enacted—Compulsory Insurance Proposals Fall Flat

NEW YORK, April 14—Of the 43 state legislatures that convened this year, 25 have completed their labors, 18 still are in session and so far no measures have been enacted into laws that are at all inimical to motoring in general and the automobile industry. This in a nutshell sums up the situation as seen by Harry Melxell, secretary of the Motor Vehicle Conference Committee, which represents the National Automobile Chamber of Commerce, Motor and Accessory Manufacturers' Association, Rubber Association of America, National Automobile Dealers' Association and the American Automobile Association, whose duty it is to watch legislation in general and to co-operate as far as possible in aiding law makers to act intelligently on bills pertaining to automobiles.

As Melxell sees it, so far there has been little legislation contravening the fundamental principles advocated by the Motor Vehicle Conference Committee and it is felt that the three pamphlets prepared by the committee—"Special Taxation for Motor Vehicles," "State Regulations of Motor Vehicle Common Carriers," and "State Restrictions of Motor Vehicle Operation" 25,000 sets of which have been sent broadcast through the country to every member of the state legislatures, chambers of commerce, boards of trade and executives of every dealers' and users' organizations—have been most effective. These pamphlets contain the views of the organizations making up the Conference committee and have been of great help, it is said, in enabling legislators to get the proper perspective.

More than 2000 bills dealing with automobiles directly and indirectly have been introduced bearing on common carriers, gasoline taxes, size, weight and speed restrictions, compulsory insurance, compulsory stoppage at grade crossings, compulsory equipment, fees and taxes, anti-theft and numerous highway measures.

About 80 bills on gasoline taxes have been filed and of this number few have got through. Not more than six states at the outside have increased gasoline taxes or added them. Common carriers have come in for considerable attention and while the tax provisions imposed have been drastic yet none of the measures is considered bad legislation from the motorists' viewpoint. Scores of bills increasing registration fees have been introduced but not many have become laws.

Compulsory insurance seems to have fallen flat, for of about 50 bills intro-

duced seeking to compel such insurance, none that affects the owner has been adopted. Size, weight and speed restrictions have not been startling. Unlike 1921, relatively few bills have come up for consideration and not many of these have got as far as the governor. This is considered a victory for the Conference committee.

In the matter of headlight legislation the tendency has been toward the standard set up by the Society of Illuminating Engineers and in the direction of uniformity.

## Duesenberg Condition Never More Assured, Says Rankin

INDIANAPOLIS, April 13—"The condition of the Duesenberg Automobile and Motors Company was never more assured or in better shape than now in the face of the unwarranted suit for receiver brought by a lone two-share stockholder," said President L. M. Rankin. "With real assets of more than one million five hundred thousand above current liabilities the concern is absolutely solvent. It has no over-due merchandising accounts, and all bills due are fully paid up. It has no bank indebtedness, and no outstanding notes, and the cash balance increased more than \$50,000 during the last two months. The company is operating at a handsome profit with production at the highest point ever reached, and with further manufacturing increases in sight. Sales are now unprecedented we believe for a car of this class, with a demand considerably in advance of the present output. The unwarranted suit for receivership brought against the company by one lone stockholder will have no effect whatever on the future of the concern for there is not a more solvent motor car company in the state of Indiana." Hearing for the suit will be held Tuesday, April 17.

## CITROEN IS HONOR GUEST

DETROIT, April 13—M. Andre Citroen was the guest of honor at a dinner tendered by Detroit automobile manufacturers at the Detroit Athletic Club this week.

Those at the luncheon were Hugh Chalmers, Charles D. Hastings, Fred J. Haynes, E. LeRoy Pelletier, Alvan Maccauley, A. T. Waterfall, Burnet Hershey, Charles Sorenson, S. D. Waldon, B. F. Everitt, and Messrs. Julien Kegrresse, Deloïre and Dufresne of the Citroen party, John W. Staley, H. B. Joy, R. P. Joy, C. L. Redden, H. H. Emmons, Charles B. Warren, Fred J. Belanger, Charles Hughes and H. B. Griffith.

## MURPHY ENTERS RACE

INDIANAPOLIS, April 14 — Jimmy Murphy, winner of last year's 500-mile speedway contest, has been entered to drive a Durant Special in this year's race which will be held May 30.

## Chemical Subsidiary Is New General Motors Corp. Unit

### To Sell Gasoline with Anti-Knock Compound, Developed by Research Laboratories

NEW YORK, April 14—Announcement was made this week at General Motors headquarters of the organization of a new subsidiary, the General Motors Chemical Co., which will market through gasoline selling stations, refiners and large distributors a gasoline to which has been added an anti-knock compound which has been developed after many years of experiments by the General Motors Research Corp. at Dayton, O.

"Every motorist is familiar with the fact that when automobiles are pulling under load and especially at low speed, as for instance, up hill in high gear, there is a tendency for the engine to knock or detonate, which decreases the power," says the official announcement. "This new anti-knock compound tends to eliminate the knock, materially improves the performance of the engine and makes a smoother running engine."

The anti-knock is understood to consist of tetra ethyl lead, to which is added a second compound. These two are in the form of a volatile liquid which is used in the proportion of 5 c.c. per gal. of gasoline for engines of the usual compression. It is expected that the wide marketing of this anti-knock will ultimately result in the use of higher compression engines and thus in greater mileage per gallon of fuel consumed. The higher the compression the greater the amount of anti-knock required. The anti-knock is mixed with ordinary gasoline.

This knock preventive was developed after many years of research, initiated by C. F. Kettering and carried forward by Thomas Midgley, Jr., and his associates.

## McQUAY-NORRIS SELLS STOCK

ST. LOUIS, April 16—McQuay-Norris Manufacturing Company, last week sold through Farnum, Winter & Co., 33,333 shares of no par value common stock, the first public offering which has ever been made of this company's stock or securities. The stock was offered at \$25 per share and the entire issue was sold and oversubscribed on the day it was offered. It was listed on the Chicago Stock Exchange April 12, and closed at 25% that day. It will be listed also on the St. Louis Exchange.

No changes are contemplated as a result of this financing. The management of the company will remain, as it has been. Earnings available for dividends on the common stock in the past five years, it was announced, computing taxes at the 1922 rate, have averaged \$380,570.85, or approximately \$3.80 per share.



# Rural Demands Speed Up Production

## Illinois Corn Belt Dealers Have Good Spring Opening

### Show Held in First Week of Month Considered as Valuable Stimulant

BLOOMINGTON, Ill., April 14—Spring trade among the automotive dealers of the Corn Belt of Illinois is opening satisfactorily, and it is the general opinion that the show held the first week of March at the Coliseum was a valuable stimulant. During the month of March, the Rue Motor Car Co. of Bloomington, sold 118 Ford cars, which is the largest number ever sold in one month in the history of central Illinois. This record breaking business is believed to be a reliable indication of the prosperous condition of the industry in this section.

The dealers in the higher priced cars also report business uniformly ahead of a year ago. The Rickenbacker agency, recently established for the first time in this city, with J. H. Whittington as distributor, reports the sale of 25 of these cars so far this year. Even the higher priced type such as the Cadillac, Wills-St. Claire, Lincoln, and Marmon, show a greater demand than was the case a year ago.

Central Illinois dealers are deeply affected by the prosperity or hard times among the farmers. This is essentially an agricultural district and when the farmers experience good crops and receive high prices for their products, the men engaged in the automotive industry prosper in proportion. When crops are poor, or prices low, then the motor vehicle business suffers. This spring, ideal weather conditions, for the first time, by the way, in several seasons, enabled the farmers to plant their oats early. The bulk of the rain fell at the right time, during the first half of March, and since then there has been but little. This is just what the farmers wanted. They have planted their oats and plowed for their corn crop and, within a few weeks, if the temperature is mild, will sow the latter seed. Winter wheat is coming through in good shape and gives promise of a good average crop.

With prices on all kinds of grain and live stock holding up satisfactorily, and new crop conditions being all that could be desired, automobile and tractor salesmen are finding the average farmer a good prospect for one or the other.

### INCREASES IN PARTS PRICES

NEW YORK, April 13—Price increases in numerous lines of automotive equipment, including parts and accessories, are under way. The process has been going on for some weeks and recently is becoming much more general. Most of the announcements of manufacturers attribute price increases to higher costs of material and labor.

### ALL GARDNER MODELS INCREASED

ST. LOUIS, April 14—The Gardner Motor Co. has announced an advance in the prices of all models of Gardner cars. The new schedule shows increases ranging from \$30 on the standard open models, to \$80 on the sedan.

The following are the new and old prices:

	Old Price	New Price
Roadster	\$ 965	\$ 995
Phaeton	965	995
"Radio" Sport Phaeton	1,095	1,145
Coupe	1,095	1,145
Sedan	1,365	1,445

### Six Racing Dates Announced By Hoosier Motor Speedway

INDIANAPOLIS, April 14—Six racing dates have been announced for the half-mile dirt track Hoosier Motor Speedway near here, which was launched last fall. May 5, June 9, July 4, Aug. 4, Labor Day, Sept. 3; and Oct. 13 are the days when the kings of the dirt circles will perform. J. V. Lines, manager of the Hoosier Speedway, says that entries have been received from practically every central state for the first May meet and that Ralph Ormsby, who won the big race last year, will be on hand. It is promised that the track will be improved after the May meet and the turns banked higher.

### PEORIA ANNUAL DINNER

PEORIA, Ill., April 14—Twelfth annual dinner of the Peoria Automobile Dealers' and Accessories' association will be held April 24 in the Peoria Automobile club, Chillicothe, according to an announcement today by Fred C. Zillman, secretary. Clyde Jennings, editor of MOTOR AGE, will be the principal speaker and Paul J. Killeen, president of the Illinois Automotive Trades Association, is expected to be among the guests. Two hundred are expected to attend and three directors for three year terms will be elected.

### MECHANICS BEING ORGANIZED

PEORIA, Ill., April 14—In a bulletin to all members of the Illinois Automotive Trades Assn., F. C. Zillman, secretary and manager, gives the information that an organizer from the International Association of Machinists has been attempting to unionize the automobile mechanics employed in Peoria garages and dealer establishments. The bulletin states that similar efforts are being made in other cities.

### GRAY TOURING INCREASED \$30

DETROIT, April 14—An increase in price of \$30 on the standard five passenger phaeton has been announced by the Gray Motor Corp. The phaeton now lists at \$520 against the old price of \$490. The remainder of the line remains unchanged: Roadster \$490, coupe \$715, coach \$785, sedan \$835.

## Truck and Tractor Makers Approach Capacity Schedules

### General Industrial Expansion Work Creates Increase in All Branches

NEW YORK, April 16—Increase in schedules by truck builders is featuring operations at automotive plants owing, for the most part, to a readier demand from the agricultural sections of the country. There is, also, a wholesome demand for vehicles in general industrial expansion work. Programs are being moved up toward factory capacity with makers in a few instances reporting 100 per cent production. The rapid growth in the use of the motor bus is taxing production facilities, output being restricted because of plant limitations.

The improvement in the condition of the farmer is being reflected on the tractor outlook, a pronounced upward swing being evident in this branch of the industry. Renewed interest is developing in the Southwestern states with some betterment in demand from the Northwest and Southeast. As the spring season advances a steady forward movement is looked for in tractor buying.

The same influences that are promoting the expansion of truck and tractor production are making themselves felt in the car manufacturing field. The demand from rural communities is one of the chief factors in keeping automobile production on a high level, with schedules closely following those of March and in the case of some of the smaller producers exceeding them.

Pressure is being exerted on manufacturers from practically all buying centers for immediate deliveries of cars. Dealers within easy distance of factories are increasing the number of driveaways and boat shipments are relieving the delivery situation somewhat. There is no marked improvement in rail movements, equipment still being inadequate to meet factory requirements. The major automobile plants, however, are finding it difficult to maintain output on a level with unprecedented retail demand.

This is due in a measure to the fact that many of the larger plants are devoting an increased percentage of manufacturing facilities to closed car production and there is still difficulty and delay in obtaining a sufficient supply of bodies for the car output. In some sections of the country, because of local conditions, open cars retain a strong hold on public favor but there appears to be a growing demand for the closed type of vehicle.

Scarcity of raw material, while having no perceptible effect on motor vehicle production, is proving to be a retarding factor on parts operations.

## Suit for Receivership Filed Against Lexington Motor Co.

Hearing on Creditor's Petition Alleging Insolvency Set for  
April 28

INDIANAPOLIS, April 14—A receiver for the Lexington Motor Co. of Connersville, Ind., was asked for in a suit filed in Federal Court here, Wednesday, by the Jacques Mfg. Co., of Wilmington, Del., manufacturers of automobile bodies, on a judgment for \$59,342.

The petition alleges that the Lexington company is insolvent with assets of \$1,794,000 and liabilities of \$3,470,000.

Argument on the hearing will be heard by Judge A. B. Anderson on April 28.

The financial difficulties of the Lexington Motor Co. have been serious for several months. A creditors' committee has been directing operations for a considerable period with a trustee in charge of the plant. Merchandise creditors have been making shipments on open account to the trustee in the hope of averting court proceedings and keeping the plant in operation.

The current liabilities approximate \$1,350,000 of which only \$220,000 is due to banks. Accounts payable aggregate \$827,000 and notes and acceptances payable \$313,000.

Issuance of \$1,500,000 in first mortgage bonds was authorized on March 1, 1922. They were to carry interest of 7½ per cent and were due March 1, 1934. The sale of these bonds was undertaken by the New York banking house of Harvey Fisk & Son, but considerable difficulty was experienced in disposing of them and only a third of the issue was sold. Inability to dispose of the entire issue brought the financial affairs of the company to a crisis. F. B. Ansted, president of the company, has made every effort to dispose of the remainder but has met with indifferent success. He has worked night and day for months on plans which he was hopeful would ward off a receivership and provide the company with much needed working capital.

The Lexington company is a part of the United States Automotive Corporation which owns all the outstanding capital stock of the Ansted Engineering Co., the Ansted Spring & Axle Co., the Connersville Foundry Corp., the Fayette Painting & Trimming Co. and the Teetor-Hartley Motor Corp., as well as Lexington.

W. C. Durant contracted with the Ansted Engineering Co. to supply him with Ansted engines for use in the Durant six and it was reported two months ago that he was negotiating for the purchase of this company. An agreement on terms could not be reached, however. It is understood that Durant advanced the company \$396,000 for which he accepted mortgage bonds as security.

The proceeds from the sale of the bonds authorized last year were expected to make available for working capital

the money owed Lexington by the Ansted Engineering Co. and provide additional funds for general corporate purposes. The bonds will constitute a closed first mortgage of all the fixed assets of the Lexington and Ansted companies.

The Lexington company received the mortgage on the Ansted assets in payment for advances made to it by Lexington during the development of the Ansted engine.

The stock of the company outstanding consists of \$1,700,000 in common and \$600,000 in first preferred. The authorized common stock was changed in May, 1922, from 6,000 shares of \$100 par value to 500,000 of \$5 par value. Six thousand shares of second preferred have been retired to the treasury in exchange for 120,000 shares of the \$5 par value common.

A further issue of 120,000 shares of the \$5 par common was made in exchange for the previously outstanding 6,000 shares of \$100 par common and 100,000 shares of the common were issued for the purchase of the assets and liabilities of the Fayette Painting & Trimming Co.

All the plants of the United States Automotive Corp. are located in Connersville, except that of the Teetor-Hartley company which is at Hagerstown, Ind. Practically all the directors of the holding corporation are residents of Connersville. Most of them are directors of the subsidiary companies.

The officers of the Lexington Motor Co. are, president, F. B. Ansted; vice-presidents, C. C. Hanch, G. W. Ansted, F. I. Barrows and Emery Huston; secretary and treasurer, LeRoy A. Hanson.

## Oakland Speedway, Inc., Is Name of New Track Company

California Promoters in New Venture with Track at  
Oakland

OAKLAND, Cal., April 14—The new speedway to be built here, as announced recently, will combine the interests which promoted and owned the Cotati and San Carlos bowls, one of which was abandoned, apparently because of fire, but both of which, as a matter of fact, proved rather unsatisfactory because of difficulties of transportation due to poor location. Articles of incorporation for the new speedway, field at Sacramento, give it the name of the Oakland Speedway, Inc., and announce its capitalization as \$250,000. These articles were filed late in March, and it is understood that at that time \$35,000 had been paid in, and the owners of the Cotati and San Carlos speedways have contributed the materials now in those bowls as part of their payments toward the total of the capital stock.

The group of men backing the venture includes J. Francis O'Connor, Jack Prince, who built both of the speedways above mentioned, and Fred M. Johnson, who is an official of an Oakland lumber company. Virtually all the stockholders in the Cotati and San Carlos bowls are understood to be interested in the new venture, which is to be located between Hayward and San Leandro, just outside Oakland, where transportation facilities are perhaps better than they are in any other part of northern California.

## Old Man Winter's Last Prank



When a heavy snow storm invaded Spokane, Wash. recently and the "beautiful" was piled up high in front of the Finlay Studebaker Co.'s window so that passers-by could not see, the Finlay company marched one of the Studebaker models out in front and using the snow for a background, let it be known that a little thing like a snow pile didn't mean a thing to them.



## Pneumatic Tire Production Increases, Solids Fall Off

NEW YORK, April 14—Figures compiled by the Rubber Association of America for the Bureau of Foreign and Domestic Commerce show an increase in the production of pneumatic casings and tubes during February as compared with the previous month, but a decrease in the output of solid tires.

A comparative table of inventory, production and shipments is as follows:

PNEUMATIC CASINGS				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	66	4,174,216	2,055,134	1,506,806
February	66	4,691,329	2,084,308	1,562,365
March	63	5,183,286	2,645,790	2,973,963
April	65	5,464,336	2,401,187	2,056,651
May	65	5,523,095	2,721,503	2,639,273
June	64	5,042,147	2,838,890	3,133,260
July	63	4,834,106	2,476,636	2,695,095
August	63	4,629,392	2,905,209	3,029,823
September	64	4,612,037	2,504,744	2,502,106
October	64	4,082,958	2,674,662	2,588,770
November	62	4,064,976	2,733,134	2,379,708
December	59	4,599,208	2,655,942	2,934,079
1923				
January	62	4,695,916	3,127,270	2,994,297
February	60	5,224,387	3,217,987	2,588,639
INNER TUBES				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	66	5,246,647	2,343,393	1,859,724
February	65	6,141,956	2,596,774	1,702,583
March	63	6,991,118	3,017,511	2,090,737
April	65	7,230,096	2,650,573	2,329,343
May	65	7,189,552	2,970,696	2,938,947
June	64	6,186,534	3,130,629	3,073,679
July	63	5,675,839	3,086,199	3,630,744
August	63	5,207,228	3,808,224	4,220,055
September	64	5,164,757	3,501,442	3,558,971
October	64	5,488,033	3,787,758	3,420,680
November	61	6,210,053	3,850,908	3,075,023
December	59	5,732,125	3,411,074	3,825,949
1923				
January	62	5,838,310	3,951,885	3,748,651
February	60	6,771,958	4,039,202	3,001,697
SOLID TIRES				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	11	181,769	40,224	33,294
February	11	183,448	39,492	36,805
March	11	182,197	49,433	48,350
April	11	173,748	46,664	52,309
May	11	170,904	57,640	60,711
June	11	169,808	66,089	63,408
July	11	176,375	71,595	60,425
August	11	189,698	84,313	69,435
September	11	200,016	82,767	66,797
October	11	213,942	85,480	71,275
November	11	234,684	85,775	61,466
December	10	244,061	77,221	64,570
1923				
January	11	262,462	83,343	60,611
February	11	270,191	75,457	63,394

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total, represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

### HUFFMAN TRUCK REORGANIZING

ELKHART, Ind., April 14—Upon application of bondholders, the Superior Court of Elkhart County has appointed a receiver for the Huffman Brothers Motor Truck Co. The action was taken to conserve the assets of the company, pending reorganization and refinancing during the process of which the company is continuing to operate without change in management.

Earl R. Huffman, treasurer and general manager, said the production and sale of trucks is continuing as before and that there will be no change in policy. The cause of the receivership,

he said, is not due to present conditions but dates back to a previous receivership during which the company became delinquent in its payments on an outstanding bond issue of \$165,000 and has not yet caught up.

### BIG NASH SHIPMENTS

KENOSHA, Wis., April 14—Nash factory shipments from Jan. 1 to April 9 exceeded the total combined shipments for January, February, March, April and May, or the first five months of 1922. All indications point to the biggest year, by a wide margin, in Nash history, says E. H. McCarty, general sales manager.

## New Method of Handling Old Cars Tried by These Dealers

### Orange County, California, Men Have Central Market Plan for Used Cars

SAN FRANCISCO, Cal., April 14—A new method of handling used cars has been adopted by the members of the Automobile Trade Assn. of Orange County, in the southern part of California. The plan is being given a thorough test, since virtually all the dealers in the county are members of the association. These dealers sell only new cars. All the used cars which they have taken in as payments on new cars are sent to a used car market, opened and maintained by the association in the three principal cities of the county—Santa Ana, Anaheim, and Fullerton. To these markets, also, owners can take their cars to be sold for cash, to be turned in on better used cars, or for deposit and sale to their credit on a new car from whatever dealer the owner may designate.

An expert appraiser is employed at each market, and only such cars are accepted as can be rebuilt into worth-while machines. A guarantee is given with each machine, and each car is put in order by the shop of the dealer who sells that particular car in new models. This method of reconditioning and rebuilding cars has tended to stabilize the market by insuring to the buyer of a used car the transportation and other qualities stated in the guarantee given with it.

Under the agreement under which these used car markets were opened, the dealers have discontinued all taking in of used cars on the models they offer for sale new. That is to say, these Orange County dealers are selling only new cars and are taking only cash, or time payments, for them. The owner of the used car must take it to one of the markets and dispose of it himself, thereafter taking the cash so received to the dealer as payment on the new car. Thus the dealers have established a standardized, stabilized public market for the sale of used cars that heretofore have been traded in, or which the owners seek to trade in. They have disposed of their own used car problem, and have provided the prospect for a used car a chance to buy one under full guarantee of its exact worth.

### PERFECTION ORDERED SOLD

KEOKUK, Ia., April 7—Sale of the Perfection Tire Co.'s property at Fort Madison has been ordered by the court, as a result of application for such authority sought by Paul S. Junkin, receiver. The court order directs a private sale and includes everything except a few articles specified for repairs for the plant. Raw material to the amount of 14,271 pounds, 42,000 inner tube valves and work in process and chemicals, oil and compound stock will be sold.

## Increase in Sales in Middle West Territory, Says Bureau

**Passenger Car Sales Increase 100 Per Cent Over Same Period of 1922**

DES MOINES, Ia., April 14—New car sales here for the first three months of 1923 show a remarkable increase over sales of the corresponding months of last year, according to figures compiled by S. P. Whiting, secretary of the Motor Trades Bureau. Passenger car sales are almost 100 per cent better than last year and truck sales show even greater increases. Passenger car sales for January, February and March of this year totalled 1353, as compared with last year's record of 760 cars in the same months.

Truck sales for the first three months of this year number 136. During the same period last year only 55 trucks were sold. The following table shows the sales by months:

	—Pass. Cars—		—Trucks—	
	1922	1923	1922	1923
January .....	148	348	12	45
February .....	211	338	13	50
March .....	401	667	30	41
Total .....	760	1353	55	136

## \$1,300,000 Bid for Units of Standard Parts Company

CLEVELAND, April 14—Attorney W. D. Turner, of the law firm of M. B. & H. H. Johnson, this week bid \$1,300,000 for the Eaton Axle, American Axle and Sess Spring and Axle plants of the Standard Parts Co. of this city, a \$20,000,000 automobile parts and accessory manufacturing concern that is in process of liquidation.

Receiver F. A. Scott of Standard company filed in the United States District Court here, a request for instructions as to whether or not the bid should be accepted.

Turner's law firm represents many large corporations in this city and the middle west, the White Motor Co. among them. He declined to state whom he represented.

It is said the probabilities are that the bid will be accepted, as it is much higher than was offered when the receiver attempted to sell the plants at public sale. Turner inclosed a certified check for \$130,000 with his bid, and he promised to pay the remaining \$1,170,000 in installments.

### MASTER TRUCKS REORGANIZED

CHICAGO, April 14—Reorganization of the Master Trucks, Inc., has been completed, following dismissal, recently, of a petition in bankruptcy filed against the company.

A new corporation known as Master Motors Corp. has been organized and has purchased all assets and good-will of the old corporation, and will operate the company's truck factory at 2381 Archer avenue, Chicago. According to

H. C. Keenan, vice-president and general manager, the new corporation will have assets of approximately \$800,000 and no direct liabilities. There have been no changes in personnel and the manufacture and marketing of trucks will continue without interruption, Keenan said.

## Thermostatic Paint Drying Room Built By Memphis Man

MEMPHIS, Tenn., April 14—The Lilly Carriage Co., at 217 Union avenue, Memphis, after years of scientific research and experience in the vehicle and now the automobile trade, and many tests, announces the completion, installation and successful operation of a dustless, thermostatic drying room for automobile painting.

It is a great time-saver and has been approved by many varnish makers. The process is now on exhibition at their shop. By means of a continuous stream of dry, warm air, thermostatically maintained, a temperature that equals nature under the most ideal uninterrupted condition, dries the paint evenly, quickly and naturally. Forced into the drying room through a perforated floor, air virtually smothers the car in a thick warm blanket. It is impossible for the dust to rise. Specking and checking are thus avoided, and other benefits obtained.

### WILLYS-OVERLAND REDUCES DEBT

TOLEDO, O., April 14—Preparations for the payment of \$3,500,000 to the Union Trust Co. have been made by the Willys-Overland Co., which will reduce the present bonded indebtedness to approximately \$10,000,000.

The aggregate payments on the funded bank debt during the last 10 months have been about \$7,000,000, including the present payment.

Sale of real estate not used in the production of cars has enabled the company to apply large sums to the reduction of the debt, which becomes due Dec. 1, 1923. Company officials are assured that they will suffer no embarrassment in the extension of the unpaid portion if it is not all liquidated by the end of the year.

### LARGER OUTPUT FOR HATFIELD

SIDNEY, N. Y., April 14—Stockholders of the Cortland Cart & Carriage Co. have voted to increase the capital stock to \$1,000,000 and there will be increased activity in the development of the new Hatfield Six. The increased capital will provide for a larger production of Hatfield cars and a more active sales campaign, plans for which are being formulated by Harry T. Clinton, who recently joined the company as assistant general manager.

### WILLARD HAS BEST MONTH

CLEVELAND, April 14—March proved the biggest month in point of production that the Willard Storage Battery Co. has ever had, according to an announcement by R. C. Norberg, vice-president and general manager of the company.

## Burst of Retail Demand for Cars Follows Zero Weather

**Milwaukee Dealers, Held Back by Snow and Blizzards, Now Going Good**

MILWAUKEE, Wis., April 16—A burst of activity in retail demand for passenger cars has followed a decidedly favorable change in climatic conditions in the past ten days, and reserve stocks of dealers, accumulated since last fall, are being depleted by new orders and those placed during the winter for spring delivery. Up to a little more than a week ago some dealers were inclined to complain that buyers were not willing to take cars according to delivery specifications, because driving conditions even in the heart of the city were very bad and country travel was impossible, due to a sustained spell of five or six weeks of heavy snow and zero temperatures. Today, buyers are clamoring for cars ahead of specified dates.

Although outside factories have made arrangements for quick transportation of cars to distributing points, which are far greater than ever existed before, the situation with respect to a quick supply of cars is steadily growing less favorable. The Crosby Steamship Line has added two extra boats for the Muskegon, Mich.-Milwaukee run across Lake Michigan, providing a double daily service absorbed mostly by the passenger car trade of Michigan, northern Ohio and Indiana, in the effort to get cars into the northwest through Milwaukee and avoiding the congested Chicago gateway. The Crosby boats are handling a large volume of Nash cars and other Wisconsin-built cars destined for eastern markets on the run to Muskegon, solving any return-load problem. The Goodrich Transit Co. is now operating two daily boats across the lake.

## One Way Streets Decrease Accidents By 75 Per Cent

NEW ORLEANS, April 14—"The glaring highlight must go or motorists will go to jail," was the announcement made by the Commissioner of Public Safety, Stanley W. Ray, at the largest meeting of men from the automotive industry ever held in New Orleans. Every branch of the automotive industry in the city was represented by more than 200 men.

The calling of the meeting in the commission council chamber was a surprise. Dealers and service station men were not apprised of the commissioner's intentions until he announced that the week of April 8-14 would be "No-glare Week."

The number of automobile accidents has been decreased during the last two years by the order, which made streets one-way traffic thoroughfares in the commercial section of the city. This, it is found, has decreased the number of accidents 75 per cent and increased the facility of traffic movement.



## Cleveland Has Best Three Months in Entire History

**Period Ending April 1 Is Best in Point of Sales for Whole Industry**

CLEVELAND, April 14—The Cleveland automobile industry has had the best quarter year in its entire history during the three months that ended April 1.

Although March shipments from the factories and sales by distributors and retailers were larger than in any other month of the year, April has started out with a rush of business that indicates the volume will be at least 20 per cent greater than it was in March.

During the slow months, most of the factories, by rearrangement of distribution, putting in conveyor systems and interior remodeling, were put on a more productive basis, so that today more cars are being produced without expansion of space.

Dealers from the small towns in the Cleveland district, who have come to Cleveland recently, report that there is no indication that the usual growth of sales during April, May and June will not take place this year. They report, the people in their territories are working, wages are high, and factories are all busy on orders that will keep them occupied for several months.

In the city of Cleveland, April sales are going far ahead of those of March. The Automobile Club has issued 23 per cent more licenses in the first three months of 1923 than it did the corresponding period in 1922.

Peerless, Jordan, Stearns, Chandler, and Cleveland Six all have had a larger quarter this year than they did last, and it also is true that the corresponding quarter record for 1920 was exceeded.

Winton conducted a nation-wide sales contest with very good results and business has been good. Templar, which was placed in the hands of a receiver some time ago, is being operated, with an inventory gradually being worked down. There is an excellent market for this car. Grant also in the hands of a receiver, is being operated, and an inventory is being worked down. It also has received an impetus in orders during the quarter just ended, and April sales are larger than in March.

Dealers in some of the popular priced cars are having trouble in keeping up with orders. The Cadillac, Buick, Peerless, Chandler, Jordan, Nash, Franklin and Olds agencies all have sold more cars this year than they did in the same period last year, with many more prospects on their books.

## Increase in Truck Prices Predicted by Manufacturers

DETROIT, April 16—Price increases on truck parts by unit parts makers foreshadow a general rise in specialized

truck prices, according to manufacturers here, and there is likelihood that these will become effective over a period of the next month. The increases will be moderate and will represent the additional cost of parts and materials entering into truck construction.

These are in addition to increases made since the first of the year and will be additional to increases reported in the past few weeks. Companies are denying recent increases and say that in making the new prices public, they are anxious to avoid the impression of stringing out increases over a period of several months.

## Ford Making 6400 a Day as New Selling Plan Goes In

DETROIT, April 14—Tremendous deliveries of Ford cars in March had the effect of clearing away all the cars that were in transit or in stock in practically every section of the country. Going into April, the company is working without any surplus in cars whatsoever and orders are running from 500 to 1000 daily in excess of production even at the rate of 6400 a day.

General attitude of other manufacturers on the new weekly purchase plan instituted by Ford Motor Co. is that it is a constructive move and will bring many new buyers into the market. The one serious objection to it is that many persons might be led to buying cars who cannot afford to operate them. With precautions against this, the general feeling is that the plan should prove very successful.

## GOTFREDSON ORGANIZED

DETROIT, April 14—Gotfredson Truck Corp. has been organized in Detroit as an offshoot of Gotfredson Truck Corp., Ltd., of Canada, to manufacture a specialized unit vehicle for general distribution in the United States. The officers of the American company are Benjamin Gotfredson, president; M. H. Coleman, secretary, and Robert B. Gotfredson, vice-president and general manager. The company will make a full line of trucks ranging from one to five tons capacity.

## AUTO-LITE BUSINESS GROWS

TOLEDO, April 14—Production of Auto-Lite starting and lighting equipment for the month of March totalled approximately 80,000 complete units, according to an announcement by President C. O. Miniger, who states that plans for the second quarter indicate an even greater volume of business each month as compared with the first quarter.

## METCALF WITH AMERICAN BOSCH

SPRINGFIELD, Mass., April 14—The American Bosch Magneto Corp., at a meeting of its board of directors April 3, elected as its treasurer, Maurice Metcalf, formerly vice-president of the Universal Portland Cement Co. of Chicago, and more recently president of the International Steel Corp. of New York.

## Dealers Abandon Efforts to Defeat Oregon Gasoline Tax

**Levy to Be Imposed Raises Price of Gas to 23 Cents a Gallon**

PORTLAND, Ore., April 14—Efforts of automobile men of Oregon, under the leadership of the Oregon Automotive Trades Assn. and the Automobile Dealers' Assn. of Portland to defeat the additional one-cent gasoline tax passed by the last session of the legislature, through a referendum of the measure, will be abandoned, it was announced this week, after a conference between leading automobile men with Governor Pierce and members of the Oregon State Highway Commission.

The additional one-cent tax, which goes into effect May 25, will raise the gasoline tax from two to three cents per gallon, making it one of the highest in the union. The conference was called by Governor Pierce, who pointed out to the automobile men that a referendum of the measure and its possible success at a special election would cut down the receipts from the gasoline tax for state road purposes and would seriously curtail state highway work.

The automobile men, who have always been thoroughly in favor of the good road program, agreed to drop the action toward referendum, provided Governor Pierce and the state highway commissioners would use their influence to bring about the passage of a law at the next session of the legislature to reduce automobile license fees on used cars. The automobile men had strongly urged such action by the last legislature and when it was not taken, they began the move to refer the gasoline tax measure to the people, largely in retaliation. Governor Pierce and the highway commissioners pledged their efforts in this direction, and Governor Pierce promised to appoint a committee, upon which the automobile men will be strongly represented, to investigate the situation and prepare a recommendation for a workable type of sliding fees, based upon the age of the car, for presentation to the next session of the legislature.

## FORD PLANT FOR CHARLOTTE, N. C.

CHARLOTTE, N. C., April 14—The Ford Motor Co. is planning the construction of a large factory branch here. Edsel Ford was here the past week making a personal investigation of the situation and inspecting sites on which the company holds an option. Reports are that he was well pleased with the local situation, but found freight rates somewhat a handicap. An effort is being made to overcome this handicap.

Joseph W. Holt is manager of the Ford assembly plant here. His territory covers North and South Carolina. He is the prime mover in the effort to secure the Ford expansion here.

## Texas Dealers Open Bureau for Information on Roads

### Automotive Trade Bureau Is Name Given New Touring Body

FORT WORTH, Tex., April 14—The Fort Worth Automobile Trades Assn., composed of the various lines of business in the automotive industry, has established an automotive trade bureau, something new in this section of the country. The new bureau will maintain offices with the Chamber of Commerce. The governing body is made up of one man from each of the five divisions of automotive trade in Fort Worth. One of the essential duties of the new bureau will be to keep itself and the automotive trades in Fort Worth informed of the conditions of highways leading out of Fort Worth. Ed. McRea has already sent out requests to residents along the highway to communicate with the bureau about conditions of the roads. McRea will shortly make a personal inspection of the highways, with a view to bringing all roads leading to Fort Worth up to the standard. The bureau wants a better highway from Fort Worth to Denver, Galveston, Houston, Oklahoma City, Brownwood, Waco, Austin, San Antonio, Wichita Falls, Mexia, Abilene, Amarillo and a score of other points.

The Fort Worth Auto Trades Assn. takes the position that good highways sell more automobiles, tires and accessories than any other one thing, and the organization intends to make "this silent salesman" the best there is in the Southwest.

### Sales Value of Rubber in 1922 Reached \$906,178,000

NEW YORK, April 14—Sales value of rubber products in 1922 amounted to \$906,178,000, almost placing the American rubber industry in the billion dollar class. Of this enormous total, the automobile industry contributed more than half with a sales value total of \$532,192,531, using 464,136,363 pounds of the total of 570,376,141 pounds of crude rubber consumed by the entire industry.

These statistics are the compilation made by the Rubber Association of America, based on reports from 260 manufacturers, 37 importers and dealers and six reclaimers, representing approximately 90 per cent of the manufacturers and importers in this country, who produce and handle 97 per cent of the nation's rubber business.

### GASOLINE STOCKS INCREASED

WASHINGTON, April 15—Stocks of gasoline were increased during January by 119,000,000 gallons. Figures compiled by the Bureau of Mines show that gasoline stocks on Feb. 1 were nearly 300,000,000 gallons in excess of stocks on the corresponding day last year. The production figures indicate that the output of gasoline is keeping abreast with the

increased manufacture of automobiles.

The output of gasoline in January amounted to 623,823,337 gallons, a new high monthly record. The indicated domestic consumption of gasoline in January was 443,128,456 gallons, excluding imports, for which figures are not yet available. Exports of gasoline in January, including shipments to insular possessions, amounted to 61,630,469 gallons.

## Rickenbacker Seeks to Interest High School Students

DETROIT, April 14—Rickenbacker Motor Car Co. is co-operating with its Detroit distributing company, Cunningham-Richards Co. in a plan to arouse interest among boy high school students in the automotive industry generally and to promote the sale of Rickenbacker cars. The factory co-operation will consist largely in throwing the plant open to the students' inspection and the detailing of an executive to take the boys through in groups giving them a detailed instruction on the manufacture and production methods in factories.

With the interest of the boys aroused, the distributing company plans to enlist from their ranks junior salesmen who will receive remuneration for assistance given in the sale of cars. The plan has received the approval of principals and will be instituted at once.

### CHANGES AT GOODRICH CO.

AKRON, O., April 15—W. A. Johnson, manager of pneumatic tire sales of the B. F. Goodrich Co., has been promoted to the position of merchandise manager. The new position is created under reorganization of the executive sales personnel of the Goodrich Co. A. G. Partridge, for many years vice-president of the Firestone Tire & Rubber Co., who has been with Goodrich for the past eight months in a special executive sales capacity, succeeds Johnson as pneumatic tire sales manager. H. M. Bacon, formerly with the old Diamond Tire Co. prior to its merger with Goodrich, is moved up to Partridge's place as manager of all branch operations. He has been manager of western district tire sales.

L. A. McQueen, sales promotion manager, becomes advertising manager, succeeding E. D. Gibbs, who resigned April 1. Gibbs, who formerly was advertising manager of the National Cash Register Co., will open New York offices as a counsellor in advertising and sales.

### DUNLOP IN PRODUCTION

BUFFALO, N. Y., April 14—Products of the Dunlop Tire & Rubber Corp. of America were placed on the market here this week. The first set of Dunlop tires was bought by President Edward P. Germain, from Samuel M. Whinlan of 1219 Main street, at a cost of \$290.75 for five tires. Over 500 men are now employed in the Dunlop plant, and little by little the organization is being built up.

## Rapid Advance of Spring and Price Rumors Start Sales

### Oregon Dealers Compare Business with That of 1920 Spring

PORTLAND, Ore., April 14—The rapid advance of spring and the growing belief that there will be an increase in automobile prices shortly, are having their effect on the automobile market in Portland, and the last couple of weeks have seen a resumption of business comparable to the times of 1920.

Sales of standard lines have been running heavier than for any time in two years, according to state license figures, the market for low and medium priced cars being particularly strong. The demand for cars of the higher priced field is about on a par with this time last year, although the demand for the lower priced cars is considerably stronger.

While Portland and immediate vicinity is showing marked improvement over previous months, it is in the outlying districts of Oregon that the greatest improvement is being shown, automobile distributors here state. This is due to the improved financial condition of the farmers and stock men. During the last several weeks, heavy shipments of cars have been made into the outlying districts; these generally being in the nature of diversions of stock coming from the eastern factories. There have been several instances of notable drive-aways of cars from Portland distributors' warehouses, also.

## Starts School for Skilled Workers to Meet Car Demand

TOLEDO, April 19—The Willys-Overland Co., has been forced to start a training school for skilled and semi-skilled workers in order to supply the demand for increased production at the local plant.

There are now about 11,000 men at work and it is necessary that the force be increased by nearly 50 per cent within the next few weeks.

Production at the plant will reach 50,000 cars by the first week in April, according to estimates of officials, and that will be more than half the total production of last year.

### PRELIMINARY TRANSPORT REPORT

WASHINGTON, April 14—Preliminary reports on the motor transport phase of the transportation survey will be made by A. H. Swayne, vice-president of the General Motors Corp., and chairman of the Transportation Conference Committee on "Relation of Highways and Motor Transport to Other Transportation Agencies," at the annual meeting of the Chamber of Commerce of the United States, in New York, May 9. He will appear before the transportation group meeting when delegates from the automotive industry and other transportation agencies will participate in an open discussion of the problem.



## Large Enclosed Car Demand Helps to Keep Prices Down

### Some Manufacturers Said to Be Selling Open Models at Loss Under Present Costs

DETROIT, April 14—Continuance of a large volume of enclosed car business is having an important effect in keeping prices at present figures, something which would probably be impossible if the business was largely open cars, as before. In almost every case that price increases are mentioned it is the open cars which would show the largest additions, with only moderate additions to the enclosed car models as protection from probable further market advances.

There are a number of companies in the industry which report that they are practically making open cars at a loss, but by pushing the sale of enclosed models, are able to escape the possible ill effects of advances. So long as there is a good steady market for enclosed cars there is the possibility of long deferring the necessity of making price increases, and unless material costs maintain their upward trend, it may be possible to escape them entirely.

### Enclosed Car Profits

Enclosed cars have always been priced sufficiently high to give manufacturers a safe profit margin, this being due to production difficulties and the former relatively low output of these types. A large part of the cost has been due to the extra labor and time required, rather than additional material. As demand increased, prices were still kept relatively high because of manufacturing uncertainties. There has been no advance in labor costs and consequently the enclosed car, priced safely before, is now found priced high enough to give makers an adequate margin of profit.

What percentages of output is enclosed cars varies with all manufacturers, but in every case it is considerably higher than a year ago, and in most cases is showing steady gains monthly, even over the high outputs of winter months, and with summer approaching. There is not a factory in the industry whose output now is not better than 30 per cent and in most cases it is better than 50 per cent enclosed cars. Hudson-Essex business is almost exclusively enclosed car business, due to the low prices on their models and the concentration of selling upon these types.

If city buying falls off considerably, and the rural and farm buying turns mostly to open models as expected, this contingency will probably cause a general increase in prices. Should there continue to be the present proportion of output between the two models prices may go on as now. In any event, the prices on open models will be advanced more than the enclosed, and this is already witnessed in the scattered increases that have been made.

### 20,277 OVERLANDS IN MARCH

TOLEDO, O., April 13—Shipments of cars from the Willys-Overland Co. plant in March totalled 20,277, the largest month in its history. For the first quarter of 1923, 44,478 cars were made, nearly three and a half times as many cars as were turned out the first quarter of last year. Willys-Knight shipments for the first quarter equalled the total shipments of these cars for the entire last year and, at the present rate, will exceed the 1922 production by the middle of May. President John N. Willys predicts an unprecedented business for his company this year and stated that retail orders now on file with dealers far surpass records at the same date for any season in the history of the company.

## Women More Careful Drivers Than Men, Says Officer

CHICAGO, April 15—Women are more careful drivers of automobiles than are men, according to the observations of Lieut. John Martin, head of the traffic division of the Chicago police department, who for 12 years has superintended the flow of traffic at State and Madison streets, in the loop.

"They obey the ordinances better," he said, "They are more cautious and what is more important they do not 'take a chance.' That is the fault of the good man motorist, and no matter how skillful he is, and how lucky he is, the chances are that some day 'taking a chance' will result in a smash-up."

### SUES KENTUCKY WAGON MFG. CO.

LOUISVILLE, Ky., April 14—Allegations that the present assets of the Kentucky Wagon Co. are not sufficient to meet the obligations and that the transfer of the company to the National Motors Corporation was fraudulent were contained in the petition of the Phoenix Coal Co. filed in Circuit Court here in a suit for \$5,773.43. The plaintiff made both the Kentucky Wagon Manufacturing Co. and the National Motors Corp. defendants in the suit, claiming both were responsible for the indebtedness on eight notes.

### BILL FOR TITLE REGISTRATION

PHILADELPHIA, April 13—Representative W. Howard Metcalf, of Delaware county, has introduced two bills in the legislature that affect motor transportation. One is for the establishment of traffic courts to try all those accused of violating the motor vehicle laws and the other is to provide a comprehensive system for the registration of titles to motor vehicles.

### MOLINE TRACTOR UP \$75

MOLINE, Ill., April 14—The Moline Plow Co. has announced an increase of \$75 in the price of the Moline tractors. The latest price on the 9-8 is \$725.

## 400,000 Used Cars in Hands of Dealers, N.A.D.A. Reports

### National Assn. Estimates Losses on This Stock in Three Months Will Be \$23,591,981

ST. LOUIS, April 14—Following a compilation of figures secured from 3333 dealers in 18 states, the National Automobile Dealers' Assn. estimates that on March 15 there were 400,000 used cars on the floors of the retailers, representing a total capital investment of \$152,206,340, and that the losses that the dealers will absorb on this stock and investment in the first three months of 1923 will reach \$23,591,982. The dealers answering the questionnaire acknowledged stocks totalling 37,015, with a capital investment of \$13,350,119. The study discloses that there is an average of 10.88 cars in the hands of 38,000 dealers, with an average capital investment of \$4005.43 per dealer.

The figures gathered disclose that the average price which the dealers are allowing for old cars is \$360.67, and it is expected the public will pay less than the average figure quoted. The lowest average allowance reported was \$259.16 in the state of Iowa and the highest was \$522.40 for Louisiana. The largest average per dealer loss was recorded from Louisiana at \$2004.74 and the lowest \$241.40 from Minnesota. It is estimated that automobile stocks are turned four times a year and if the losses here shown are the experience of each turnover, the losses for 1923 will exceed the staggering total of 1922.

In a statement, the association says:

"The capital invested is the cost at which the dealers acquired these stocks and does not include the figures for reconditioning, overhead, etc. They are the bare figures of what the dealers allowed for these cars in accepting them in trade on new car sales. These figures do not include reports from exclusive used car stores, but are solely from dealers who are handling used cars as part of a new car business.

"The market values which these same dealers report is accepted as the actual worth of these used car stocks and attention is called to this peculiarity—that it is almost impossible for anyone to establish a market value for any article until that article has been sold. N.A.D.A. executives believe that the market values reported are simply figures for which the dealers on their own best judgment expect to sell these cars. Fluctuations can have an immense effect on the ultimate results when these used car stocks have been moved.

"Accepting the figures as reported, however, as the actual value of the used car stocks on hand March 15, in 18 states, there was an apparent loss of millions. The acquisition cost was \$1,391,480 more than the present market values reported."

# A. E. A. Promotes Clean Up Week

## Paint Up, Clean Up, Dress Up, Is Motto for May First

### Organization Gives Automotive Dealers Tips on Making Business Places Attractive

CHICAGO, April 14—A general clean-up week for automotive dealers beginning May 1 is being promoted by the Automotive Equipment Assn. through its merchandising department of which Arthur R. Mogge is manager.

"Paint up, Clean up, Dress up and Cash in," is the motto which is being broadcast to automotive merchants everywhere by the A.E.A., through jobbers' salesmen and otherwise. Stickers bearing this motto have been printed and 500,000 of them will be distributed to automotive manufacturers and jobbers for use on their mail going to dealers.

The idea behind the movement, as expressed by Mogge, is that by making a special effort to make their places of business clean and attractive, dealers will be able to sell more merchandise and maintenance. Because spring is generally considered house-cleaning time, it was decided to promote this movement at this time. The appeal is directed to all those businesses engaged in the sale of automotive equipment and service.

The following concrete suggestions for cleaning up are made to dealers generally:

1. Repaint gas pump. (If it is owned outright, check up on accuracy, add new hose and fittings.)
2. Check up oil vending devices, test and repaint pumps, replace broken bottles or attachments.
3. Clean up premises, rake the yard, plant grass seed and flowers.
4. Wash or paint buildings.
5. Repair and repaint signs, fences, etc. Tear down old signs which do not relate to business or merchandise offered for sale, or which have become unsightly.
6. Wash and retrim display windows. Utilize some of the many attractive window trims furnished free by manufacturers, use bright crepe paper and suitable backgrounds.
7. Clean up all showcases, display stands, shelves, etc., and clean and rearrange stocks.
8. Get repair shop or service station in order, clean up the place, paint the walls, scrape and rub the floors, recondition and repair all equipment.
9. Purchase adequate stocks, equip-

ment, etc., to supply the demand and do a profitable spring business.

10. Read the books, "A Greater Business" and "Shop Profits."

11. See the two A.E.A. films, "Ask 'Em to Buy" and "Shop Profits."

The jobbers' salesmen are prepared to make further suggestions as to window trimming, special displays and attractive arrangement of stocks. Dealers are encouraged to "Ask the jobbers' salesman" and the latter is expected to cooperate in every way in making a success of clean-up week.

## 3 Rotary Valve Frontenacs to Race at Indianapolis

INDIANAPOLIS, April 14—Louis Chevrolet is building three racing cars in his plant here, for participation in the next International 500-mile race May 30. The cars have been entered in the race by the Scheel Motors Co. of St. Louis, and will be known as Scheel-Frontenacs. Engines Made at St. Louis.

ST. LOUIS, April 14—The Scheel Motors Co., in whose name three cars being built by Louis Chevrolet have been entered in the Indianapolis race, is located at 3922 West Pine boulevard, this city, Herbert Scheel is president. The company builds the Scheel rotary valve engine and the Scheel-Frontenac racing cars will be powered with these engines.

## PAIGE DROPS TRUCKS

DETROIT, April 14—The Paige-Detroit Motor Car Co. announces that it has discontinued the manufacture of Paige motor trucks, in order to devote all its facilities to passenger car production. The company's service department will continue to service all Paige trucks.

## Driveaways Create a Highway Problem in Ohio

COLUMBUS, O., April 14—Thad H. Brown, secretary of State of Ohio, has called a conference of registration officials from West Virginia, Indiana, Pennsylvania, Michigan, Kentucky and New York for the purpose of discussing the highway problem in Ohio and adjoining states caused by automobiles in transit from factory to dealer.

Brown calls attention to the large increase in the movement of new cars through Ohio to other states so that the problem has become very serious. Abuse of "in transit" privileges by dealers and driveaway companies is annoying the public, he said. The cars are crowding the highways and in many cases causing extensive damage to other motorists and there is no way to fix responsibility because of the misuse of the cardboard license numbers. The conference will be held in Columbus the latter part of April.

## Railway Says 97 Per Cent of Motorists Are Careful

### Observation of 100,000 Automobiles at Pennsylvania Crossings Shows 3 Per Cent Negligent

NEW YORK, April 14—Ninety-seven per cent of motorists who cross railway tracks are careful, while the remaining 3 per cent display marked and, in many cases, actually criminal negligence, according to a special pamphlet issued by the insurance department of the Pennsylvania Railroad System, which makes these statements after observing more than 100,000 automobiles at the railroad's 12,000 crossings.

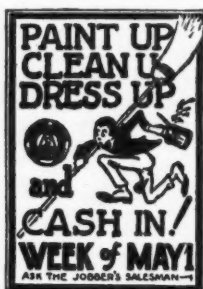
From June to September last there were 682 accidents at grade crossings on this system. In 148 of them death or injury to persons resulted, 90 being killed. Automobile accidents accounted for 494 of the total, involving the death of 71 persons. Sixty per cent of the trains involved were running at less than 20 miles an hour, showing that recklessness instead of speed was to blame. Motor trucks accounted for 29 per cent of all the accidents, though constituting only 11 per cent of the total automobiles involved. Only four accidents occurred to passenger busses.

Seven were killed and 17 injured attempting to beat trains over the crossings. Fourteen were killed and seven injured while crossing bells were ringing. Five were killed and 22 injured where cars were driven past warning watchmen. Drunkenness caused three deaths and three injuries. There were 70 cases of automobiles running into the sides of trains, resulting in 14 being killed and 22 injured.

## LIBERTY SALE AGAIN PUT OFF

DETROIT, April 14—Sale of the Liberty Motor Car Co. by the receiver was again postponed this week to April 24, at the request of Henry B. Joy, sole qualified bidder. In continuing the sale it became known that Joy has been in touch with others interested in continuing the property under the guidance of Percy Owen and that it is expected to perfect their plans for the reorganization within the coming two weeks.

Announcement that Joy was behind the movement to refinance the company and get it back on its feet has had the effect of rousing much dealer interest. Distributors remaining with the company and many who have changed to other lines are reported to be lining up and many orders have been placed for cars for immediate delivery. Pending the outcome of the sale, no hint can be given of the plans of the company, but it is understood the line will be changed in some particulars and that new production methods will be installed under the guidance of a new manufacturing executive.





## IN THE RETAIL FIELD

The Winters Motor Co. of Winters, Tex., has been incorporated. The capital stock is \$30,000. Among the incorporators are G. A. Cresswell, R. M. Connelly and G. C. Cresswell.

The Capital Chevrolet Sales Co. of Austin has chartered recently. The capital stock is \$15,000. The company will handle Chevrolet cars at Austin, Tex.

DeBrown Auto Co. of Des Moines, Ia., has given up its contract for Cleveland and Chandler cars in this territory. Both of these lines will be taken on by the Gibson Truck Co.

The R & V Knight Sales Co., Des Moines, Ia., has moved from 119 Locust to 1441 Locust street.

The Alemito Co. of Ia., distributor in Iowa for the Bassick Co., has moved to 1116 Locust street, Des Moines.

The Stokes-Haynes Co., newly organized at Des Moines, Ia., to distribute Haynes cars, has located at 1013 Grand avenue.

The Bliss-Williams Co., Rockford, Ill., has been organized to handle the Paige and Jewett cars, and has merged in its organization the Thoren Motor Sales. Bliss was a former printing plant owner and Williams is a veteran in the Rockford automotive field.

The Bagley Motor Car Co. has been formed at Glen Ellyn, Ill., and has opened a sales agency for motor cars at 530 Crescent building.

Fred Thomas, Bloomington, Ill., has been appointed distributor for the Oldsmobile car in the central Illinois territory and has opened a garage and sales agency at 109 South Madison street.

Lloyd Snyder has been appointed distributor of the Columbia car for Sangamon county and has opened a sales agency and service station at 31 South Fifth street, Springfield, Ill.

J. E. Dearmin, late of the Travis Cadillac Sales Agency, Peoria, Ill., has formed a partnership with W. E. Ritter of Springfield, Ill., and will open shortly a new sales agency and service station for the distribution of the Cadillac car in the Sangamon county territory.

William H. Mosely, for five years connected with the American Exchange Bank of New York City, has been preparing to open the second Ford agency in Springfield, Ill. He has leased the Bruce building at 216-22 North Seventh street and will move in as soon as remodeling is completed.

O. L. Bromley, Decatur, Ill., has purchased the motor car business in that city of W. A. Fathauer & Son, located at 122 South Franklin street, and will transfer the plant to 1145 North Van Dyke street. The new owner will be distributor for the Auburn car in the Macon county territory.

Peerless Eights will be distributed from Minnola, Long Island, and vicinity by the Landers Motor & Supply Co.

Stackhouse & Thomas of 500 Main street, Asbury Park, N. J., have taken the dealership for Asbury Park and Ocean Grove for the Peerless Eight.

George W. Reinhold Co., distributor of Case cars in the Philadelphia territory, has appointed Victor A. Saiders as wholesale manager. He will cover the territory of eastern Pennsylvania, southern New Jersey, Delaware and the eastern shore of Maryland.

The Gilbert Chevrolet Sales Co., Cincinnati, has been incorporated as a retail sales firm, to do business at 2352 Gilbert avenue, Cincinnati. This concern is located in the large building near Peebles Corner that was erected by the General Motors Corporation to house the office service department of the Chevrolet Motors Co.

The Galbraith Motor Co., Rockford, Ill., which now operates a branch in Moline, Ill., in addition to its central shop in Rock Island, has taken a 10-year lease on the lower floor and basement of the new Eagles clubhouse which will be ready for occupancy about Sept. 1. The garage will have a 20,000 sq. ft. floor space. The Galbraith agency also handles the Oldsmobile car.

Rolls-Royce of America, Ind., has established its Chicago branch at 2512 Michigan avenue, in the old Winton quarters.

The Orr Motor Co., Pittsfield, Mass., will soon have a new sales and service establishment, construction of a building having been started. The Oakland Co. will have space in the same building.

The Columbia Springfield Co. has been formed in Springfield, Mass., to distribute the Columbia Light Six in that territory. John C. Schmidt is manager of the concern.

Henry W. Cheney has been appointed service manager for the Red Arrow Auto Co., Nash dealer in Orange, Mass.

Baldwin & Deming have been named as Willys-Overland dealer in Greenfield, Mass.

Forest Park Garage, Springfield, Mass., has been made an associate dealer with Norcross-Cameron Co. for the Maxwell, Chalmers and Peerless. C. J. Gowrie has been appointed sales manager.

A. J. Jolly, formerly with the Young Motor Co., has opened a used car salesroom in Springfield, Mass., conducted under the name of Dwight Street Auto Exchange.

A. Park Shaw, formerly sales manager for Smith & McCarthy, Pittsfield, Mass., has acquired a controlling interest in the T. T. M. Co., Chevrolet dealer in Pittsfield. Rigobert MacFarlane has left the firm and moved to California. Arthur B. Treadwell retains his interest.

Smith & McCarthy have taken the franchise for the Hupmobile in Pittsfield, Mass. This firm recently took on the Franklin. Andrew Smith, head of the concern, has returned from a three months' sojourn at Miami Beach, Fla.

Thomas P. Sullivan, who with his uncle, Walter J. Sullivan, was for several years in the automobile business in Los Angeles, Cal., has returned to his former home city of Pittsfield, Mass., where he has been appointed sales agent for Dunn Bros., Gardner dealers. He is assigned the South Berkshire territory, with headquarters in Great Barrington.

The Shaw Motor Sales Co., Pittsfield, Mass., has put C. H. Leonard in charge of its North Adams branch. K. M. Foster, at the Central Garage in Great Barrington, has been made branch manager in the South Berkshire field.

The Van Sleet Motor Co., North Adams, Mass., has bought a large building in Adams, which it will remodel into a sales and service establishment for the Ford and Lincoln.

The New South Street Garage, Pittsfield, Mass., has been appointed distributor of the Lee tire for Berkshire county.

The Connolly Motor Sales Co., as sub-dealers for the Automotive Associates, Inc., of Pittsfield, is handling the Durant and Star in Great Barrington, Mass. W. G. McClintock has a similar appointment in Stockbridge, Mass.

The Moon-Pittsfield Co., Pittsfield, Mass., has established its salesrooms in the North End Garage, where sales and service are quartered in the same building.

William Jones, service manager of the R. D. Britton Co., East Hartford, Conn., has taken over the Crown Garage at No. 27 Charter Oak Place, Hartford.

Fred W. Lycett, Hartford, Conn., manager of the local branch of the Connecticut Auto Sales Co., has been appointed wholesale manager for the state of Connecticut.

Russell P. Taber, president of the Reo and Peerless selling organization, has been elected president of the Hartford (Conn.) Automobile Dealers' Association. Earl C. Bowman, of the Bowman Motor Car Company, was elected vice-president. Dwight A. Burnham of the Acme Motor Sales Co. and Arthur Fifoot were re-elected treasurer and secretary respectively.

The Ashwell Service Station at 341 Trumbull street, Hartford, Conn., has been appointed official sales and service station for the United Motors service on Delco, Remy and Klaxon.

E. B. Barnard Hartford, Conn., formerly associated with the Palace Motor Sales Corp., and A. E. Burnham of the service staff of the L & H Motor Co., have opened the service garage at 293 Capen street and have also taken on the Hupmobile under an associate dealership with the L & H Motor Co.

Southern Falls Motor Co., Inc., has been appointed Oldsmobile distributor at Sioux Falls, S. D. The president and general manager is G. H. Evans. This company absorbs the Doyle Oldsmobile Co., former distributor.

Commerce Motor Co., Shreveport, La., has been appointed distributor of the Oldsmobile in that territory. Jules Barre is president and manager.

J. R. Carnahan, formerly with the Apperson Company, has become manager of the Pearl Motor Sales Co., Milwaukee and Spaulding avenue, Chicago. This company sells Overland, Jewett, Paige, Willys-Knight and Peerless cars.

Among new Maxwell dealers are the following: J. C. Haberman, 1610 University avenue, Madison, Wis.; Royal Allison, Wallace, Neb.; C. S. T. Garage, Sequin, Tex.; Wm. Wendt, Spencer, Ia.; Gastineau Motor Co., Nineteenth street and Amesbury avenue, Middlesboro, Ky.; Riverside Garage, Newport, N. H.; Southern Auto & Supply Co., 400 South Twenty-first street, Meridian, Miss.; and C. E. Johns Auto Co., Cheboygan, Mich.

McDonald Bros., Brazil, Ind., have moved their electrical and battery shop from 504 National avenue to larger quarters at 415 National avenue.

M. C. Barrett has signed up as Gray distributor in the Springfield (Mass.) district.

Martin Motor Co., 438 St. Louis street, Springfield, Mo., has been appointed Chalmers dealer.

S. W. Goodrich has been appointed Chalmers dealer at Pittsfield, Mass.

W. J. Horning Co., 4846 Woodward avenue, Detroit, has been appointed distributor for the Auburn car. Among new Auburn dealers are the H & H Sales Co., Lockport, N. Y., and Kehror & Hildebrand, Bucyrus, O.

Edwards & Christ Co., which recently took on the Chicago distribution of the Gardner cars in addition to the Auburn, has moved from 2239 South Michigan avenue to 2437 South Michigan avenue where it occupies quarters three times as large as in the old establishment. This company for years sold bicycles and motorcycles. It first went into the automobile business in May, 1922, when the Auburn distribution in Chicago was taken over.

Vermont Apperson Co., Inc., Burlington, Vt., has been appointed Apperson and Dort distributor for the state of Vermont.

New dealers announced by H. C. S. Motor Car Co., Indianapolis, include Robbins Garage, 909 South Broad street, Trenton, N. J., and the H. C. S. Dayton Co., 18 South St. Clair street, Dayton, O.

The following are new dealers announced by the Auburn Automobile Co. of Auburn, Ind.: Eisil Smith, Philippi, W. Va.; Davis Bros. Auto Repair Shop, Elkins, W. Va.; Bitner Bros. Co., 318 South Main street, Connellsville, Pa.; J. U. Shoff, Boswell, Pa.; Anderson Bros. Garage, Donham, Pa.; Repine Garage, 613 McKean avenue, Charleroi, Pa.; A. M. Robinson Garage, Ambridge, Pa.

L. B. Southerland, manager of the Chicago Cadillac branch, announces the appointment of R. E. Truax as manager of Cadillac's north side Chicago branch on Broadway. Truax has been identified with Cadillac interests in Chicago for several years.

The W. H. Krueger Motor Co., 499 Jefferson street, Milwaukee, for seven years distributor of the Cole, and the Wilson Garage, 375 Summit avenue, Milwaukee, have been consolidated into a new corporation, the Krueger-Wilson Co., with \$100,000 capital, to act as distributor of the Marmon. The main display rooms will be on Jefferson street, while the Summit avenue building will be the service station.

W. E. Deakler, Hayward, Wis., has started work on the erection of a new sales and service building to cost \$20,000.

Mattie & Terber, Plymouth, Wis., let contracts for a new sales and service building, 60x150 ft., estimated to cost \$18,000.

The Fred Meyer Auto Co., Phillips, Wis., has plans for a \$25,000 garage, storage and service building, 60x145 ft., part two stories.

The Neson-Mitchell Co., 525 Jefferson street, Milwaukee, has been appointed distributor of the Stutz in Wisconsin.

The Metropolitan Auto Service Corp. has been incorporated with a capital given as \$30,000.

The Geneva (New York) Sales Co. has been granted a charter to deal in auto accessories. Capital stock is \$50,000.

E. F. Upson, head of the Detroit Electric Car Co. of Conn., and of the Wills Ste. Claire Co. of Conn., Hartford, Conn., has formed the Walker Upson Motor Car Co. and taken a new sales and service building on the Connecticut Bldg., East Hartford. The new firm takes over the Star and Durant under an associate dealership with the Connecticut Auto Sales Co.

Henry Rolfe, Jr., and William F. Quigg, Jr., Hartford, Conn., have taken over the Stearns-Knight sales and service formerly held by the Britton Co., which recently wound up following the death of Charles O. Britton, president.

The Auto Electric Maintenance Corp. has opened a service station for testing and repair of electric automotive equipment in Pittsfield, Mass., having converted an old-time wagon shop for the purpose.

The Jackson & Webster Ave. Corp. of Long Island City, N. Y., has acquired the territory for the Peerless.

The Gardner 1923 line has made its appearance at Memphis, Tenn. Craven and Hemphill Co., composed of Sam. A. Craven and R. B. Hemphill, at 338 Monroe avenue, and Rodgers Gardner, 336 Monroe avenue, a direct factory representative for the district, are putting on the sales campaign. A full line will be carried in Memphis and dealers established in West Tennessee, East Arkansas and North Mississippi.

Herman Johnson of the Johnson Garage, 708 North Westnedge avenue, Kalamazoo, Mich., has been appointed subsidiary Chevrolet agent under Kelser & Brophy. Johnson formerly handled the Elcar.

## BUSINESS NOTES

The Apex Rubber Products Co. of Akron, has been chartered with an authorized capital of \$25,000 to manufacture and sell rubber products at 411 Terminal Bldg., by N. O. Mather and others.

The Martin-Parry Corp., has secured a two year lease on the three-story fireproof warehouse at 641-643 Union Ave., Memphis, Tenn., and will occupy it shortly with a large automobile commercial body building branch sales office and assembly plant in Memphis.

Thomas Lilly is completing a structure almost opposite the Martin-Parry building site on Union Ave., Memphis, which he has leased to the Continental Body Co.

C. G. Spring Co., has started production in a new plant in Kalamazoo, Mich., which practically duplicates the one burned recently. Within two weeks the company will be at peak and spring deliveries will suffer little interruption.

The McQuay-Norris Mfg. Co., of St. Louis, manufacturer of piston rings, pistons, piston pins and bearings, is offering for public subscription through brokers 33,333 shares of common stock at \$25 a share to provide additional financing. The company has recently expanded its manufacturing facilities by acquiring new plants in Indiana. No changes in management are contemplated, it is said.

### Timken President Explains Low Profits Made in 1922

DETROIT, April 13—In his first report as president of Timken-Detroit Axle Co., President Fred Glover ascribes small profit during 1922 to taking on of large volume of passenger car business at extremely low prices to fill the plants, and to sharp increases in cost of material during the last six months of the year. Though volume of business was 100 per cent in excess of 1921, he declares the net result disappointing in that dividends paid on preferred were only partly earned, balance coming from surplus.

Readjustment of selling prices as of Jan. 1 in moderate profit in the first two months of 1923, he said, and with much greater volume in March profits should increase proportionately. Indications are that present satisfactory volume will continue through the year. Truck business, he said, is rapidly improving and demand for motor bus axles is active and encouraging. From present rate of production, volume should considerably exceed 1922, he said.

### GARFORD TRUCK CO. FINANCED

LIMA, O., March 14—By a formal vote as of March 30 the bank creditors' committee which has been directing the affairs of the Garford Motor Truck Co. has been discontinued. It is stated that the company has sold \$1,250,000 6 per cent first mortgage bonds and about \$2,250,000 five year 6 per cent debentures, the proceeds of which will be used to pay the bank indebtedness. Also a line of credit aggregating \$1,000,000 has been placed at the disposal of the company.

Changes in the personnel of the company have been made by adding John Galvin, president of the Ohio Steel Foundry Co., and L. A. Larson, vice-president of the Lima Locomotive Works, to the board of directors and appointing E. R. Curtain, president of the Lima Trust Co. and E. A. Williams, Jr., president of the Garford company, as the Garford executive committee.

Orders for a new type of ammeter have been placed with the Westinghouse Electric & Mfg. Co., by the Paige-Detroit Motor Car Co., according to an announcement by Westinghouse. This ammeter, known as the BT type, has no coils and is placed in service by threading a wire through a magnetic yoke.

The Berkshire Products Co., Pittsfield, Mass., successor to the J. & B. Co. and the Berkshire Magneto Co., will have its new low-price special timer in full production this month. Contracts are being placed in lots of 10,000 and the production schedule calls for 200,000 this year, and also for 12,000 of the Ford timer previously in manufacture.

The Madison Tire Co., is being organized at Madison, Wis., to manufacture cord tires exclusively at the rate of 150 to 200 daily, for distribution direct to the consumer. The product will be known as the Madison Cord.

The Canton Spring Co.'s plant of the Standard Parts Co., Cleveland, O., has been sold by Receiver F. A. Scott at private sale to the American Mine Door Co., a Canton corporation. The price was \$47,000.

Westinghouse Electric & Mfg. Co., announces it has received orders for Westinghouse starting and lighting outfits for taxicabs being manufactured by the Checker Cab Manufacturing Corp.

### DEALER CHANGES AT BOSTON

BOSTON, April 13—As a result of the show agencies are being placed in Boston for cars and trucks.

George J. Dunham, who had the Standard Eight, has taken the agency for the Fox car for this territory. He will have salesrooms on Brookline avenue.

Fred A. Graves, formerly handling the R & V Knight, and later with Locomobile, now has the Crane Simplex. He has not opened his salesrooms yet, but will have a place in a few days. There are some other car agencies pending.

William A. Harris, for 15 years with the White truck, is now the Eastern District Manager for Bethlehem trucks. His territory extends to Syracuse, N. Y., and takes in northern New Jersey and New York City as well as New England. He is placing agencies on a different basis, as there is no restricted territory, and dealers will not have to take any quota.

The Yellow Cab Company has opened an office in Boston on Commonwealth avenue in the former salesrooms of the Carlisle Tire Company. W. H. Brown has been appointed manager.

Harold G. Hart, formerly with the Nash factory at Kenosha, Wis., has come to Boston to take charge of the retail sales for the C. P. Rockwell, Inc., Nash distributor.

### COUNTY DEALERS ORGANIZE

ALEDO, Ill., April 13—Preliminary steps have been taken for the organization of a Mercer County Auto Dealers' Convention and at a meeting April 20 the organization will be completed. A score of dealers attended the first meeting, but the condition of the roads prevented rural dealers from attending—and added to sentiment in favor of an aggressive campaign for good hard roads. Harry Dodson is temporary chairman and Mrs. I. E. Cameron, secretary.

### JEWETTS BUY RADIO COMPANY

DETROIT, April 13—DeForest Radio Telephone & Telegraph Co. has been taken over by E. H. Jewett, president of the Jewett Radio & Phonograph Co. of Detroit. Jewett is also a director of Paige-Detroit Motor Car Co. and associated with him in the purchase is H. M. Jewett, president of the Paige company.

## Restricted Use of Gasoline Vending Equipment Upheld

### U. S. Supreme Court Nullifies Federal Trade Commission's Action Against Refiners

WASHINGTON, April 14—A decision handed down by the Supreme Court of the United States was to the effect that gasoline wholesalers can supply gas tanks to garages and gas stations under contracts restricting brands of gasoline to be sold in leased containers. The ruling upset the contention of the Federal Trade Commission that these agreements between distributors and retailers lessened competition and violated the Clayton Act.

The commission brought proceedings against the Sinclair Refining Co., the Standard Oil Co. of New Jersey, the Gulf Refining Co. and the Maloney Oil Refining Co. These producers and distributors contended that the commission was without jurisdiction, as the product was not a part of interstate commerce when furnished the retailers.

The Supreme Court decision will affect other oil companies whose methods had been in doubt, due to the action of the Federal Trade Commission.

### VOCATIONAL CLASSES URGED

BLOOMINGTON, Ill., April 14—What the state of Illinois is doing in the way of industrial education and in promoting vocational instruction, was told to automobile dealers of Bloomington, and also their employees, by J. F. Kolb of Springfield, at a meeting held here. The speaker gave suggestions toward the development of motor vehicle mechanics and how the public schools could cooperate by adding a course in mechanics.

### THESE DEALERS ORGANIZE

CENTRALIA, Ill., April 15—The Centralia Automotive Trade Association was organized at a meeting Monday night, which was addressed by F. C. Zillman, secretary and manager of the Illinois Automotive Trade Association. The charter membership is 14 and a campaign to increase the membership will be carried on in June in connection with the state-wide campaign of the Illinois Automotive Trade Association.

### DURANT IS HONORED

OAKLAND, Cal., April 13—Mayor John L. Davie has presented to the city council of Oakland a proposal to re-name Stanley Road as "Durant Avenue," in honor of W. C. Durant, automobile manufacturer. The council favors the project.

### ACCESSORY SALES INCREASE

NEW YORK, April 14—Reports from members of the Motor and Accessory Manufacturers' Assn. show that sales in February, 1923, increased 6.75 per cent over the preceding month, the total purchases amounting to \$48,518,700.



## CONCERNING MEN YOU KNOW

W. J. Welbon has given up his business in St. Louis to return to Cincinnati and enter the employ of his father, W. G. Welbon, of the Welbon Motor Car Co., Cleveland distributor.

Horace W. Avery, Jr., former manager of the Packard branch in Chicago, has been appointed assistant general manager of the Fuller Automobile Co., Cincinnati, distributor of the Hupmobile.

Robert Lanzing has been appointed vice-president of the Nash-Cincinnati Motors Co., of which Frank J. Santry is president. He will have charge of sales.

T. E. Carpenter, well known in the Middle West among tire men, died recently at his home in Des Moines, Ia. He had been associated with the Goodyear company for 11 years. He served as branch manager at several cities in Iowa and Minnesota during that time and, at the time of his death, was service manager at Des Moines.

J. A. McDaniel, former branch manager for the General Motors Truck Co., at Dallas, has been made manager for the Texas district, which includes Texas, New Mexico and western Louisiana. Branches will be maintained at Houston, San Antonio and El Paso under the supervision of McDaniel.

Appointment of W. H. Davidson of New York to special work with the Department of Commerce has been announced by M. H. Hoepf, Acting Chief, Automotive Division. Davidson will have charge of the work of the division in connection with automobile accessories. He will assist in lining up American accessory exporters and endeavor to work out a list of these firms engaged in foreign trade. He will also compile an official list of automotive accessory jobs in other lands.

Walter P. Coghlan, who has been connected with the Trexler Co. of America, manufacturers of the Trex gear shift lock and other automotive specialties, resigned as vice-president and director of sales, to take effect April 1. He has not announced what his new connection will be.

C. A. Nutting, formerly master mechanic and efficiency engineer of the Briscoe Motor Co. and recently superintendent of the Case Mfg. Co., is now affiliated with the Peninsular Products Co. in the capacity of sales manager.

H. F. Stevens has withdrawn as vice-president of the Philadelphia Nash Motor Co., Philadelphia, with which concern he had been actively identified since its inception, six years ago.

Steve H. Butler, president of the Memphis Chamber of Commerce and head of the Southern Motor Corporation, handling the Cadillac at Memphis, is president of the Southern National Bank that opened for business Monday, April 9, at 73 Madison Ave., Memphis.

Milton H. Pettit has resigned as vice-president and general factory manager of the J. I. Case T. M. Co., Racine, Wis., and on April 15 assumed new duties as vice-president and production manager of the Simmons Co., steel beds, Kenosha, Wis. Pettit joined the Case company after graduation by the University of Chicago and went to work in overalls to learn the business, then controlled by his uncles. Seven years ago he was elected vice-president and placed in charge of all operations.

Sam C. Mitchell has been appointed general sales manager of the Mason Motor Truck Co., with headquarters at Flint, Mich. Mitchell started in the automobile business with Studebaker's St. Louis branch, following which he was with the Cleveland Tractor Co. at St. Louis for three years. Joining the Dort Motor Car Co., as district sales manager in the south central states, he became special representative of the company, a position he held up to the time of joining the Durant forces.

W. E. Martens has been made assistant general sales manager of the Traffic truck division of the National Motors Corp. Martens has been with the Traffic company since his resignation from the Naval Reserve Force after the war.

District salesmen have been appointed as follows by Arthur E. Barker, vice-president of Maxwell Motor Sales Corp.: J. W. Whitley, Atlanta; Roy Coffeen, Omaha; M. V. Dunavant, Atlanta; G. J. Moulder, Chicago; M. R. Bookwalter, Minneapolis; R. W. Losey, St. Louis.

C. W. Nash, president of the Nash Motors Co., returned to the factory at Kenosha, Wis., this week after a four weeks' trip to the Pacific Coast in the course of which he visited many dealers in their places of business. Among the cities he visited were Omaha, Denver, Salt Lake City, Los Angeles, San Francisco, Portland, Seattle, Vancouver, Calgary, Winnipeg and Minneapolis.

Thomas Clements has resigned as vice-president and comptroller of the Firestone Tire and Rubber Co. The Firestone company, it is understood, will relinquish its interest in a subsidiary cotton ginning plant at Phoenix, Ariz., and Clements will take over control and operation of the gin, it is expected. Clements has been with Firestone for six years.

Nathan Lazarnick, the veteran automotive photographer of New York, announces the opening of a branch photographic plant at 5005 Euclid Ave., Cleveland, O., in charge of G. Wetzler.

U. S. Products Co. of Pittsburgh, Pa., manufacturer of bearing fittings and valve grinding compounds, which previously marketed its products through Edward S. Cassidy Co., installed its own sales department and will operate independently of any other company in the matter of selling.

## Tractors Make Possible Good Dirt Highways in Illinois

### Twenty-eight Machines Owned by Townships in One County for Grading and Dragging

BLOOMINGTON, Ill., April 16—Twenty-eight of the 30 townships of this county (McLean) now own their own tractors for handling road improvement machinery. Six new machines were purchased this spring, mostly of the five-ton crawler type, while one township invested in a ten-ton crawler. In the two townships which have not invested, due to lack of funds, the highway commissioners engage farmers owning tractors to operate the drags and graders. Insofar as road maintenance work is concerned, the horse has passed into oblivion.

Highway commissioners have found that tractors are ideal for handling road machinery. For the soil of McLean county and during the spring season when there is considerable mud to be encountered, the crawler type appears to be the favorite. They are also available for handling snow plows in winter, should there be a heavy fall. Since tractors have replaced horses, the highway commissioners have been able to go over more miles of roads at less expense than was the case when horses were used. The tractors work through the hottest days of the summer, while at such periods it was necessary to abandon operations when only horses were available. When a day's work is concluded with tractors, the machine is left by the roadside for the night and requires no attention until the next morning, and there is no time lost in preparing for resumption. With horses, the animals had to be taken to a neighboring farm or back to the home stable, and then sought the next morning and taken to the scene of operations, consuming much valuable time.

The highway commissioners of McLean county have grown expert in handling the big machines and are able to do a vast amount of work with them at the minimum of expense. Since they have become in general use, road maintenance has been revolutionized. Not only have the dirt roadways been vastly improved as compared with former years, but the cost of operation has been decreased. Motorists who use the dirt roads of Illinois note a greatly improved condition in the progressive counties where modern machinery is in service.

### FREE SERVICE CONTEST

OMAHA, April 14—A contest of unusual nature has developed during the last three weeks between two rivals in the same organization—the Sprague Tire & Rubber Co. Ponder Greer, manager of the new free service station at Dallas, Tex., has challenged J. R. Marshall, manager of the Omaha free station, to a race, the winner to be judged by the number of free calls made during a given period to aid stranded motorist.

### MILTON DRIVES FAST LAPS

LOS ANGELES, April 13—Tommy Milton has made an average of 114.7 miles an hour in several trial laps on the Los Angeles speedway in the 122 cu. in. displacement car which he will drive in the next Indianapolis race. This car is a Miller Special and is the first of six exactly alike being constructed at the Miller Engine Works for entry at Indianapolis. Four of these cars will be entered as Durant Specials and the other two as Miller Specials. The drivers, besides Milton, probably will be Murphy, Hartz, Hearne, Durant and Hill.

### OVERLAND FEEDS EMPLOYEES

TOLEDO, April 13—The industrial relations department of the Willys-Overland Co., has installed in one of the units of the factory a new employees' commissary kitchen which will have 40 steam-table stations throughout the factory and be capable of feeding 10,000 employees warm lunches at cost. President John N. Willys and members of the official family opened the kitchen with a luncheon on April 2.

### LA FRANCE BUYS TRUCK PLANT

NEW YORK, April 14—The American-La France Fire Engine Co., Inc., of Elmira, N. Y., has taken possession of its new factory at Bloomfield, N. J., which will be devoted exclusively to the production of motor trucks, thus marking the entry into a new field for which the company has been preparing for the past four years. The new plant is under the direction of C. K. Ball, works manager, and production has started on two of the five models the company is preparing to manufacture. Delivery will start in June and before December the company expects to turn out 130 of the 3½ ton models at \$4950 and the 5 ton at \$5500. The 2 ton will not come through until some time in October and the ¾ and 1 ton models will not be put in production until next year.

### WOLVERINE SALE POSTPONED

DETROIT, April 12—Sale of the American Commercial Car Co., manufacturer of the Wolverine Truck, has been postponed until April 18 at 11 a. m. The sale was scheduled for March 30.

# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Lamps Enough to Make a Light Six

Q—Is it possible to install the following equipment on a Buick four cylinder, 1922 model car without ruining it: 2 spot lights containing 32 c. p. nitrogen bulbs, 2 running board lanterns also with 32 c. p. bulbs, 2 cowl lights containing 4 c. p. bulbs, 1 McInnes bumper containing 2-4 c. p. bulbs, 1 light on motometer having 1-2 c. p. bulbs, one Hall solar stop and tail light having 1-4 c. p. and 1-8 c. p. bulbs. Three dash lights in front seat and 3 lights in rear seat all having 4 c. p. bulbs. Four parking lamps having 1-4 c. p. bulbs in each. Two head lights having 2-21 c. p. lights.

1—To determine the current drawn will be necessary to know the consumption of the lamps which you propose to install. The following is an approximate tabulation of the current required to operate the lights listed:

2 spot lights of 32 c. p. Nitrogen,	8 amps.
4 amps. each.....	8 amps.
2 running board lanterns, 32 c. p.,	8 amps.
4 amps. each.....	8 amps.
2 cowl lights, 4 c. p. bulbs, 1 amp.	2 amps.
each .....	2 amps.
2 bumper lights, 4 c. p. ....	2 amps.
Motometer light, 1-2 c. p. bulbs....	6 amps.
Stop and tail light, 4 and 8 c. p. ....	1.7 amps.
Seat lights, 6-4 c. p. ....	6 amps.
4 parking lights, 4 c. p., each....	4 amps.
2 head lights, 21 c. p. ....	6 amps.

This gives a total of 39.3 amperes required to operate this number of lights. Assuming an 80 ampere hour battery the entire number of lamps may be operated for approximately two hours after which the battery will be exhausted or completely discharged. It will be impossible to so regulate the generator to take care of this load as the normal charging rate is approximately 6 to 8 amperes. Outside of the effect on the battery the installation of these lamps will not be detrimental to the operation of the car.

2—Would regulating the generator capacity by means of third brush regulation have any bad effects on generator?

2—No.

3—How many amperes would the lights consume?

3—This is answered in number one.

4—Would it draw from the battery so fast as to create heat and ruin the battery?

4—No.

### Wire Size Needed for Extra Lighting Current

5—Can I take a No. 14 copper wire, connect it on the terminal on the motor that leads to the battery, connect it on the dash and hook all accessories on it, and then connect another wire and lead it to the frame to the dash and get ground connection?

5—Yes.

### Effect of Accessory Weight on Windshield

6—Do you think the windshield frame will carry two spot lights, 1 pair of wind-

### The Readers' Clearing House

**THIS** department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

shield wings plate glass type. 1 Sunbeam visor, 1 Folberth windshield cleaner, 1 rear view mirror with the exception of the Folberth automatic cleaner. None of the accessories drill into the frame but clamp on. Would the weight of these break the frame on rough roads where the vibration and jarring would exceed the natural weight?

6—The weight of the accessories listed would not break the frame of the windshield but it is almost certain that in time the weight of these accessories will cause a general loosening of the windshield structure on rough roads although it is doubtful whether the windshield will be affected on ordinary smooth roads.

### Maximum Speed

7—What is the maximum speed that can be obtained with this car, just as it is when delivered, that is, after it has 5000 miles of running. The car referred to is not stripped or does not contain special gears or other equipment to increase speed.—Reader, Chicago, Ill.

7—The average maximum speed of this model Buick is 52 to 55 m.p.h. under favorable conditions.

### Dirt With Force Feed Oil-ing Scores Crankshaft

Q—We have experienced some trouble with crankshaft bearings on the older systems of force feed lubrication due to sediment being forced into bearing with the oil. Can notice a rough streak on crankpins at point where oil is fed to bearing, extending nearly around pin. Would it help this condition to plug the oil holes in pin and drill new ones on opposite side (side next to center line of shaft), thus feeding oil against centrifugal force for half the diameter of pin and creating a sediment chamber inside of pin to catch the grit, which is heavier than oil?

Would this weaken the shaft to any appreciable extent or interfere with the lubrication of bearing?

We have never had this trouble before the past year or so, although we have been servicing and selling the King and other cars with force feed lubrication since 1915. We believe the cause must lie in greater crankcase oil dilution or a poorer quality of the standard brands of oil now on the market, as we have been using the best oils and of the same makes for the past eight years, changing oil often in all our engines.—The Welders, Mark Hay, Prop., Kewanee, Ill.

We would advise against redrilling the crankshaft as outlined in your letter. The theory of forcing oil in against centrifugal force has been incorporated on a few engines recently, but these shafts were originally drilled for that type of lubrication. Some observations on the trouble experienced are printed in an article in the September 14 issue of MOTOR AGE, on page 22, the title being "Pressure Lubrication Characteristics."

### EFFECT OF CURVED OR STRAIGHT BLADES IN PUMP

Q—I would like to know if a curved blade centrifugal pump will throw more water than a straight blade pump. My answer is they will both act the same.—Marvin C. Heiser, Fort Wayne, Ind.

1—For high pressure pump the blades are curved forward. In moderate pressure pumps the blades are straight or radial while in low pressure pumps the blades curve backwards. The blades which curve forward give the highest pressure but have great internal resistance. In an automobile cooling system there is very little frictional resistance in the water passages and consequently no need for a very high pressure. For this reason it is customary to use a pump in which the blades curve backward as the pressure is sufficient for the system and this construction of the blades reduces the internal resistance to flow of water through the pump.



## Garage for Storage, Washing and Sale of Accessories

I enclose rough sketch of garage which we will open about the 15th of February. This building will be used exclusively for storage, washing cars and the sale of accessories. Repair work will be done in another building. We are going to make a special effort to secure washing business and, as you can see from the sketch, we can use all the space we want for this department.

We would appreciate very much if you would give us a good plan for this department and the necessary equipment we would have to use to conduct this department in an up-to-date manner. We understand that there are some automatic systems for washing cars that operate by sprays, but we cannot gather any information along these lines. We would also like to install a vacuum cleaning system for the cars in this department.—Auto Hotel Corp., Knoxville, Tenn.

We have modified your layout considerably in order to take advantage of the width of your lot, which is not altogether adapted to a storage garage. By portioning off a 50 ft. strip the length of the building for a garage, the 25 ft. strip left will accommodate a washing plant very nicely. This plant could be made up of one or two tracks (our plan shows two), which could be built on the order of the modern big city "auto laundry."

These "auto laundries" are usually provided with platforms at the beginning and set at about the heights of the top of a touring car body. With the washing process, a man works upon each side of the car on this platform, washing and cleaning the top thoroughly. While they are doing this, perforated pipes located below the platform and under the car play sprays of water on the body from all directions, loosening the mud and dirt

### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

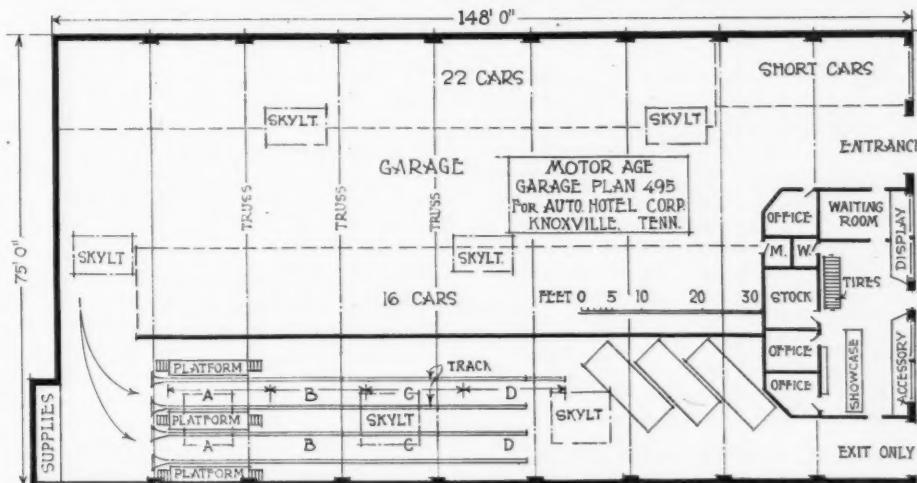
What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



and washing off the bulk of it.

When the top is thoroughly cleaned, the car is moved into the position "b", where the same men or other men go over the body with brushes and hose, removing the dirt that the sprays have left. When the car is moved to position "c" there is little left to do but to chamois it off and give it the finishing touches. Position "d" may be used to

continue the polishing process, or the track may be ended at "c", the rest of the space being used for storage.

If vacuum cleaning is done, it could be best handled in the garage section just before the car is taken to the washer, because if it is used after the washing process, it would, no doubt, stir up sufficient dust to necessitate further polishing.

## BEARINGS, CRANKSHAFT KNOCKS AND OIL LEAKS

Q—We have an Overland Model 90 and would like to know how to align the crankshaft in this engine, as it requires a new front main bearing. This engine has a two-bearing crankshaft and seems to be out of alignment, for when we tighten the main bearings piston slap develops and the bearing loosens quickly.

1—We are sending you under separate cover reprint of a bearing article entitled "How Engine Bearings Should Be Fitted," which appeared in the November 10th, Winter Service Issue, of MOTOR AGE. This will cover thoroughly all details of aligning crankshaft.

2—How can I balance the crankshaft and flywheel assembly?

2—The crankshaft should be first balanced separately. This is done by placing the shaft on parallel knife edges. If the shaft is balanced, it should remain stationary when placed at any part of a complete revolution on the parallel faces. If, when you lay the shaft on the parallel faces, it revolves in one direction or the other, the place where the weight should be removed will be denoted by the fact that the shaft will revolve in the direction of the heaviest part of the shaft. Any machinist can explain this thoroughly to you and can

do the job in a short time. The flywheel should be separately mounted and balanced, preferably by holding it on an arbor or mandrel. The entire assembly, then, that is the flywheel bolted to the crankshaft, should be balanced in the same manner.

3—The generator drive shaft leaks oil badly but can find no cause for it. The bearing is tight and the shaft has an oil fling ring and oil return which appears O. K., but the oil follows the shaft out to the leather universal, which throws it over the engine. Suggest the cause and repair for this.

3—The generator drive shaft is equipped with a felt washer which acts as an oil retainer. This felt washer is located inside of the timing gear case immediately behind the chain sprocket. It will be necessary to remove the gear cover from the case and install a new felt washer. Felt washers for installation can be secured from any Overland authorized agent.

4—There is a knock in the engine that sounds like a tappet very loose, but have checked the tappets closely and have held them while engine is running but cannot locate it. It seems to occur at each camshaft revolution and is loudest upon quick acceleration. Suggest the cause.—A Reader, Morenci, Mich.

4—If the noise occurs at each camshaft revolution, would suggest that you

examine carefully the camshaft gear, as there is possibility of a piece of a broken tooth or some metallic particle having lodged between the teeth, which would cause exactly the noise you have suggested. Piston-slap manifests itself in much the same way and we would also advise that you check the pistons to see that they do not have over .004 to .006 clearance in the cylinders. Inspect the camshaft bearings and go over each valve tappet separately. This last mentioned item is to check for high or low spots on the cam contour when it is in the non-lift position. A feeler of .002 or .003 introduced between the valve stem and the tappet will detect if there is a low spot in the cam, because, when the roller or tappet touches the cam where it has a low spot, there will be an increase in the clearance.

## TRANSMISSION ON ARMLEDER TRUCK

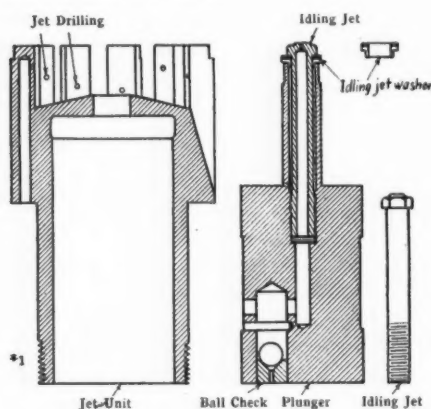
Q—Tell us what make of transmission was used on an Armleder truck model H.W. There is no name on this transmission, or at least the owners say there is not.—L. J. Hensel, Kenton, Ohio.

1—The transmission in the Armleder truck, model N.W., was manufactured by the Fuller & Sons Mfg. Company, North Pitcher St., Kalamazoo, Mich.

## Miller Carbureter Is of the Permanently Adjusted Type

Give details of Miller carbureter as installed on 8-cylinder Oldsmobile Model 44. This carbureter leaks when standing, and is too rich on low speed. There does not seem to be any adjustment for regulating the mixture at any speed.—S. J. Baptiste, 493 Locust St., care of B. & B. Garage, Akron, Ohio.

The Miller carbureter is of the non-adjustable type and when once properly equipped with jets is permanently adjusted. The jet unit and idling jet assembly are shown. The recommended Oldsmobile 8 installation calls for a 1½-in. standard carbureter with a jet unit of size 46. The jet drillings in this unit are as follows: No. 1 to 2 No. 78 drill size, No. 3 to 7 should be drilled with a No. 77 drill, and jet holes Nos. 8 to 11 with a No. 74 drill.



We advise that you remove the carbureter and check it in comparison with the data given above. It is also advisable to inspect the vacuum tank for a leaky float or check or flapper valve. Leakage while standing is due either to dirt on the needle valve seat, a bent needle valve, or a valve needing grinding. The needle valve may be reseated by turning and tapping lightly. If the carbureter internal specifications do not check with the ones listed it is advised that you communicate with the manufacturer of the carbureter for further advice.

### READER DECIDES ON CONSTANT POTENTIAL CHARGING SYSTEM

Q—We have decided to buy a constant potential recharging outfit and would like your opinion as to the value of such a set in a battery shop. We would also like to know the approximate cost of charging one battery with a set of this kind and the cost of charging when the machine is loaded up to its maximum capacity. This machine has a 3 h.p. motor and is rated at 200 amperes.

1—We firmly believe in the constant potential system. To the best of our knowledge, however, the advantage is chiefly in the fact that you can give quicker service, charging a battery in six or eight hours instead of spending from one to three days. This also means that you can operate with a smaller number of rental batteries. We doubt somewhat whether the efficiency is any greater in this type of machine than in

other types, although there is unquestionably a saving of energy, inasmuch as no regulating resistance is required. We are unable to tell you the cost of charging either one battery or a number of batteries without having an efficiency curve of the machine, and you should be able to get the maker of this outfit to supply you with such a curve. From it you can figure the cost.

### What's It Worth to Charge the Battery?

2—Would it pay us to recharge batteries for 75 cents with this outfit?

2—You can no doubt make money at this price on a 6-80 or 6-100 type battery. Here, again, it will be necessary to use your efficiency curve and the cost of current in your town before a definite answer can be obtained. To accurately figure the cost of charging a battery, you should estimate the life of the machine and the number of batteries that it will charge in its lifetime and divide this up so as to figure the machine cost per battery. You should also charge a certain portion of your rent to the battery charging department and have a certain labor charge which you add to the cost on each battery.

3—Give us any information you can as to method of connecting batteries.

3—The concern supplying the outfit should give you this information.

4—Give diagram of high rate discharge outfit which we could build and mount on an instrument board, using large size ammeter and voltmeter.

4—We are showing a diagram in accordance with your request. It is desirable to have an ammeter with a scale reading 300-0-300, although you may never run the current over about 200 amperes. Such a meter will have a shunt with it through which the main current runs. You will also need a carbon plate rheostat and a voltmeter having a 3-0-3 scale.

5—Describe the different tests which we could make with such an outfit.

5—An outfit of this kind is used to imitate the conditions on the car. When a battery comes into your shop you connect it to the high rate discharge outfit and set the rheostat to draw perhaps 100 or 150 amperes. You then take your voltmeter reading and take the readings of the three different cells, or six if it happens to be a 12-volt battery. If one cell is shorted or otherwise in poor condition it will show up by a low or possibly a reverse reading on the voltmeter.

6—Would it be cheaper for us to buy such an outfit already assembled?

6—There are outfits on the market which would cost you probably not in excess of \$10 more than the cost of meters and rheostat. It would accordingly appear advisable to buy such an outfit unless you have a lot of time on your hands and nothing to do with it. Names of concerns handling outfits of this kind will be given by letter.

### What's Needed in the Battery Shop?

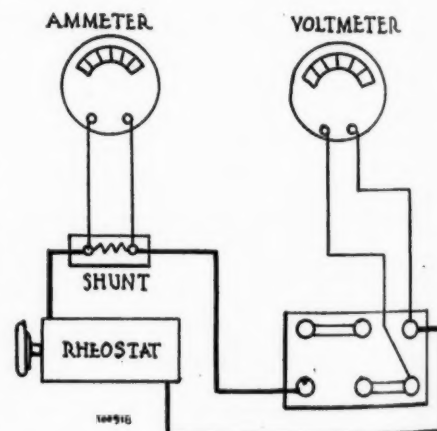
7—Give a list of tools and instruments needed for an up-to-date battery station, also list of instruments which we could make.

7—What you need more than a list of

tools and instruments is knowledge of battery work, which you can get by reading a good book on the subject. Name of such a book will be given by letter. When you thoroughly understand the work you will know exactly what you need and exactly what you can dispense with. We will, however, give a list of the major items you require.

Charging outfit such as the motor generator you are figuring on. A charging bench. Hydrometer. Special battery thermometer for measuring temperature of electrolyte. A low-reading voltmeter, for measuring cell voltage. Ammeter for measuring charging current. If you have one with your set you may do without this. Glass bottle for distilled water and another one for electrolyte. A number of 18-in. lengths of No. 12 flexible wire fitted with lead-coated test clips for connecting batteries to charging line. It is possible that these are supplied with the motor generator set. Workbench with vise. Sink or wash tank and water supply. Lear-burning outfit. For handling sealing compound you will require a stove, a pot in which to melt the compound, a ladle for dishing out the compound and one or two old coffee pots for pouring compound.

You will also need shelving or racks for batteries waiting to be repaired and you will need a number of bins for parts, such as covers, cell connectors, plate straps, terminals, handles, vent plugs, hold-down bolts, separator hold-downs and similar supplies. Many other items of desirable equipment you will find mentioned in the book to which we are referring you.



8—Give different tests on field coils for grounds and internal short circuits, using 220 volts D. C.

8—About the only test you can make is for ground, using test points connected to the 200-volt line, but one of the test point wires should have a lamp in series with it. You can test from the field connections to the frame of the machine.

9—Give different tests on armatures using 220 volts D. C.

9—The ground test is the only one you can make on an armature using 220-volt D. C.

10—Give method of adjusting Gray & Davis relay cutout.

10—Cutouts in general are adjusted by changing the spring tension or air gap.

(Continued on next page)



# Valve Timing on 1914 Hudson

Q—Give valve timing of Hudson 6-40, serial No. 63339.

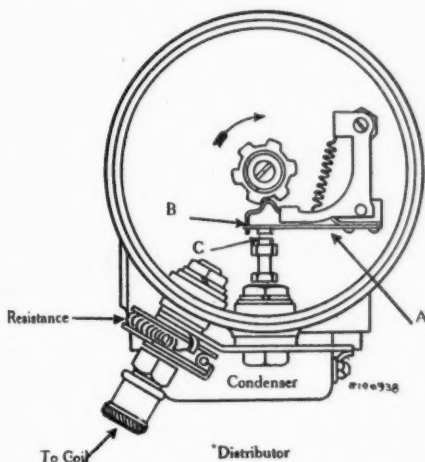
1—The car bearing serial number as above was produced in 1914. The valve timing is as follows: Intake opens 22 degs. late, intake closes 28 degs. late. Exhaust opens 40 degs. early, exhaust closes 8 degs. late. The recommended valve tappet clearance is .002 for both intake and exhaust, this with the engine warm.

2—Give ignition breaker gap distance.

2—Illustration of the distributor used on this car is shown. The gap between the contact point C should be separated by an amount equal to the thickness of two sheets of ordinary writing paper or in thousandths of an inch .010 to .012. When the engine is turned over and contact is closed spring A should be away from the top of slot B .015 to .017.

3—Give wiring diagram.—Joseph G. Herbert, Tampa, Fla.

3—Wiring diagram is shown.



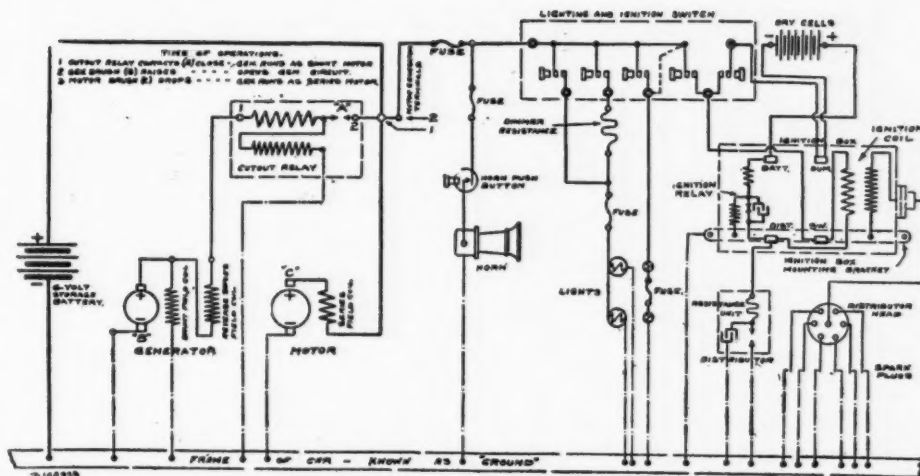
(Continued from preceding page)

The Gray & Davis cutout is no exception. A cutout in which the points stay closed too long and draw too much discharge current should have its spring tension increased. If it does not cut in soon enough it should have the spring tension decreased or else the air gap decreased. If it already cuts out properly, then the spring tension should be left alone and any necessary change made in the air gap.

## Testing Equipment Needed

11—Give diagram and building plans of complete test and instrument board for electrical service station.—J. A. Martin, The Accessory Shop, Mt. Vernon, Ind.

11—We will give you the name of a number of concerns handling testing equipment. For the wiring of your test board you will find in the Feb. 22 issue of MOTOR AGE a diagram that will be very serviceable. However, for your immediate convenience we are sending you a pencil sketch of this diagram. We are also sending you a pencil sketch showing various methods of testing field coils.



## SPEEDING UP SERIES 24 CHALMERS

Q—We are contemplating rebuilding a series 24 Chalmers and speeding up the engine and would like advice before attempting anything. What is your opinion regarding speeding up the engine by grinding the back of the cams and getting a higher valve lift, and is there anything that can be done to the valves to get more clearance? If more clearance could be gained, would there be enough clearance other places, that is, would the manifold be large enough?

1—The valve diameter on the Chalmers model 24 is approximately 2 3/16 in. This is quite a large valve and we believe that more would be gained by increasing the lift than attempting to increase the valve area. Grinding the heel of a cam will increase lift of the valve, but where extremely high speeds are desired it is generally cheaper to secure a special camshaft which gives different timing characteristics. With the present camshaft ground down you should be able to increase the speed about 25 per cent if in addition to the grinding you install light weight pistons and balance all reciprocating parts very thoroughly.

2—Would like to speed the engine up about 25 per cent. Would dual ignition with a set of plugs over each valve help?

2—Yes.

3—Would there be too much vibration in speeding the engine up 25 per cent?

3—The three-bearing crankshaft on this engine is not ideal for sustained high speed, but we believe if the parts are balanced that you can safely maintain 2500 to 2600 r.p.m. with this engine. The normal maximum speed at which the engine delivers its maximum power is 2000 r.p.m.

4—What is the weight of the car?

4—The actual weight of the chassis is not known, but it will lay in the neighborhood of 3000 pounds.

5—Maximum and minimum motor speed.

5—2200 maximum and about 250 minimum.

6—Maximum and minimum car speed?

6—Approximately 3 m.p.h. minimum and approximately 58 to 65 maximum.

7—Valve timing? Valve lift, angle of valve seat?

7—Valve timing in model 24 is as follows: Intake opens 12 degs. after upper dead center, intake closes 33 degs. after lower center. Exhaust opens 55 degs. before bottom center, exhaust closes 12

degs. after upper dead center. The recommended tappet clearance is .004 of an inch. The valve lift is approximately 5/16 of an inch and the angle of the valve seat is not known.

8—Are valve tappets roller or mushroom type?

8—The valve tappets are equipped with pin and roller.

9—What is the bore and stroke?

9—The bore is 4 in. and the stroke 5 1/2 in.

10—What is the gear ratio in high, third, second, first and reverse?

10—The gear ratios are as follows: 1st speed, 13 to 1; 2nd speed, 9.8 to 1; 3rd speed, 6.5 to 1; 4th speed, 3.75 to 1; reverse, 12.66 to 1.

11—What is the relative speed of the countershaft to the motor?

11—This data is not available, and we would advise that you communicate direct with the factory.

12—Can 32x4 1/2 disc steel wheels be placed on the hub?—A. B. Cook, West Burlington, Ia.

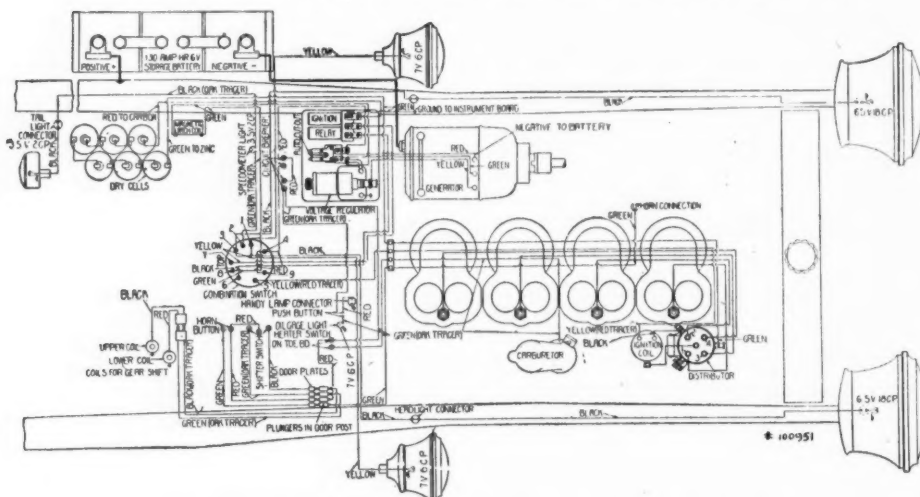
12—Specifications of the hubs on the Chalmers model 24 are not available at this office and would suggest that you communicate with disc wheel manufacturers who can supply you with this information.

## READER'S SOLUTION OF RECTIFIER TROUBLE

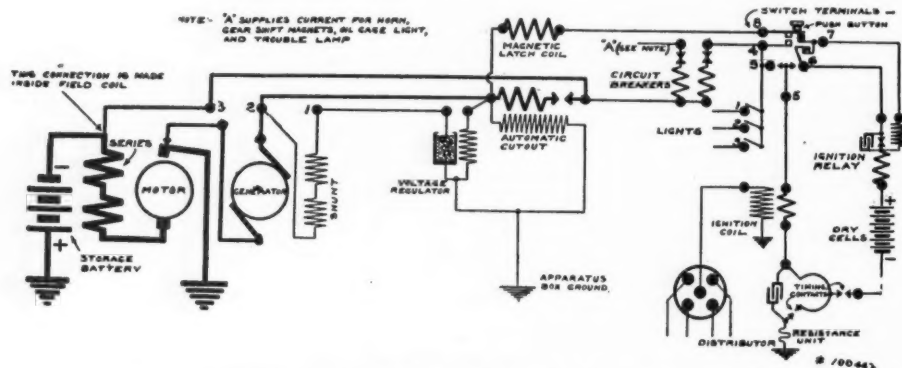
Q—On page 43 of the March 8th issue of MOTOR AGE we noticed a question in regard to trouble with a Tungar rectifier. We believe you are correct in the method given for trouble shooting as we had similar trouble and found it in the bottom connection of the bulb. The bulb would work loose from the vibration and cause a poor connection, so poor, in fact, that the heat melts the lead or solder from the bottom of the bulb. We filed it smooth and it worked again until the same thing happened. When a new bulb was installed, the trouble was overcome and it is possible that some condition of the bulb produced this trouble.—R. H. Stafford, Essex, N. Y.

(NOTE—MOTOR AGE wishes to express appreciation for the solution as above outlined.)

## Reverse Winding Eliminates Mercury Regulator



Complete external wiring of 1914 Cadillac as originally installed

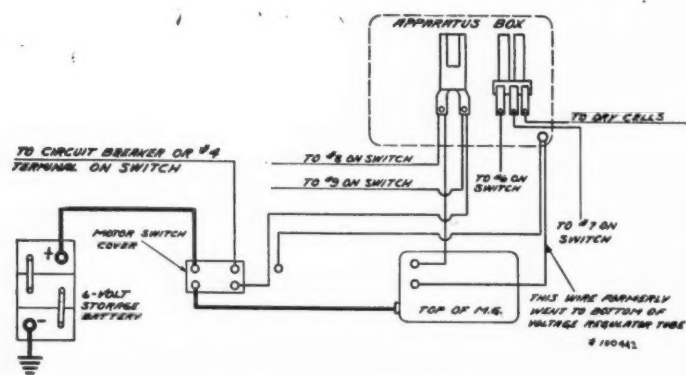


Internal wiring of 1914 Cadillac, using original mercury regulator

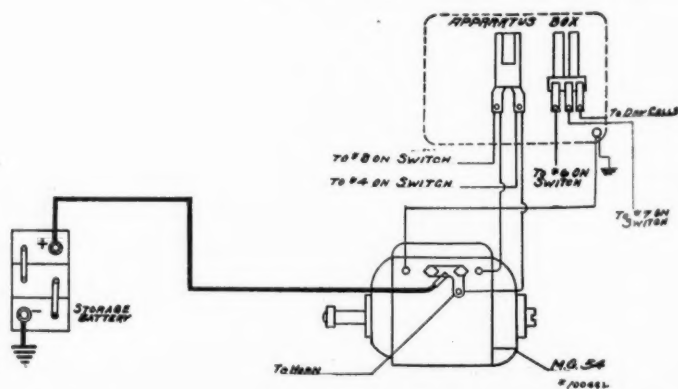
Q—Would like to have your advise as to rewiring a 1914 Cadillac touring car. Am converting this into a sport roadster and would like to have it wired as when it was new, as the body and wiring system have been taken off. The generator and starter are O. K., also the breakers and buzzing coil.

1—The wiring diagram of the open models 1914 Cadillac is shown. This original system included a mercury regulator and as this type of regulator is somewhat obsolete it is usually converted so that the system incorporates a vibrating relay for governing the generator output. The first cut shows the original

installation. The other cuts show installation wherein the mercury regulator has been removed and vibrating relay installed. If you desire to make this installation, the generator must be sent to an official Delco service station or to the Delco factory, at which place a reverse series field winding will be installed in the frame of the machine. The internal connections of the system as originally installed have been shown. The connections on the sliding switch type of 1914 Delco motor generator for installation to the vibrating relay type



Connections are made this way for Model 54 motor generator after reverse field winding has been installed



If the 3-wire motor generator is rebuilt with additional winding or field connect like this. Vibrating relay is substituted for mercury regulator in both models

of regulator are shown. The installation of the relay regulator when applied to the shifting brush type of motor generator are also shown.

2—What size battery does this car use? What voltage and how many plates? — Nitta Yuma Garage, Nitta Yuma, Miss.

2—The original battery equipment was an Exide 130 ampere hour, 6 volt storage battery, type 3 TH 13. Number of plates is 13.

### IT PUMPS OIL

Q—We are having trouble with on Olds 8, model 45. Had new pistons and rings put in last fall and lately put in new connecting rod bearings and rear crankshaft bearings. We have trouble with the two rear pistons pumping oil. We noticed when installing the new rear crankshaft bearing in the grove and oil hole was much larger than the old bearing. Would that have a tendency to force more oil out through the rear bearing? Would you advise grooving this bearing as specified in Motor Age on January 4?—F. A. Greenavalt, Lanark, Ill.

We would advise that instructions as printed in the January 4 issue be followed, and that the bearing bushing be regrooved as outlined in the instructions referred to.

### THE FORD GENERATOR IS SUITABLE

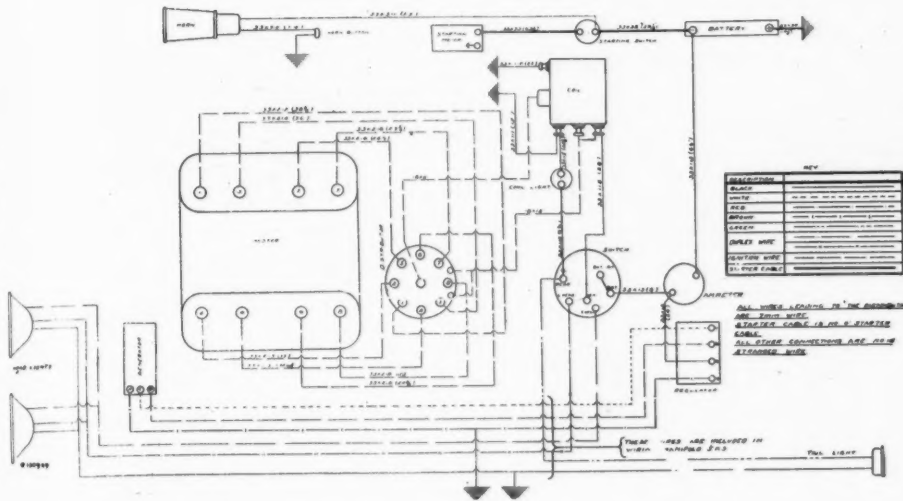
Q—What third brush generator would you suggest to install on an 85-4 Overland to replace the old Auto-Lite generator, taking the speed of the generator or the necessary r.p.m. into consideration?—Mower Auto-Electric Company, Huron, S. Dak.

1—We would suggest the use of a Ford generator. This generator is not absolutely ideal for the purpose, as it is round and you will have to make a saddle of some sort. You will also have to put some oiling means in the front bearings. For your information the Auto-Lite generator in question is supposed to cut in at approximately 600 r.p.m. and charge 5 amperes at approximately 900 r.p.m. On the other hand, the Ford generator will cut in at about 700 r.p.m., which is a trifle later. By third brush adjustment, however, you can compensate for this slight difference. Another reason for recommending this generator is that the price is comparatively low when considered in connecting with other makes of generators.



## About Ross Parts and Wiring

ROSS AUTOMOBILE CO.



Q—We have a Ross Eight car which is in need of repairs. Tell us what make of engine was used in the 1917 model and where repairs can be secured.

1—The Ross eight engine was manufactured by the Herschell-Spillman Engine Co., North Tonawanda, New York. The Herschell-Spillman Co. will furnish repairs for the engine and repairs for

the chassis may be secured from the Great Western Auto Co., Kalamazoo, Mich.

2—Publish a wiring diagram of this car.—Eureko Garage, H. I. Mercer, Strattonville, Pa.

2—Wiring diagram of this car is shown.

### THE LAW ON LIENS

Q—Please give us the law in Mississippi in regard to automotive work—when a car has a deed in trust against it before work was done.

1—The Mississippi statute gives the repair man a lien on a repaired automobile with the right to retain possession until the lien charges are paid, and to sue for judgment after 30 days. Or he may give up possession of the repaired automobile and still retain his lien, which will remain good against the car so long as the debtor does not sell or dispose of same, and if the purchaser of the debtor has notice of the repair lien, the lien will still remain good against the car in the hands of this third party. Now, if there is a pre-existing deed of trust against the repaired automobile, or other personal property, that deed is a lien prior in time and most courts have held that the deed would be superior.

2—Also, on a car where the owner has a clear title.

2—Number one answers the second question, also. Although the repair man's lien is good against a car where the owner has a clear title, there is a question in your state that you must consider. Your statute gives the seller of automobiles and other personal property a lien thereon for the purchase money remaining unpaid while the property remains in the hands of the first purchaser, or of one deriving title or possession through him, with notice that the purchase money was unpaid.

Now, if the seller records his sales contract showing a balance due on sold property, we are of the opinion that this

recording would give all the world constructive notice of the purchase-money lien. Such a lien, of course, would be prior to any repair man's lien, in point of time, and hence ordinarily superior to the latter's lien. Unless there has been a judicial decision in your state giving the repair man priority for his lien, as has been done only in a few states, it may become difficult for you to know just when the owner has a "clear title" to his car.

3—We did some work on a car for a man. We knew at the time that we were doing the work that the car belonged to this man's father, and it was the understanding that the son was to pay for the repairs, but the father knew that the work was being done. The man who had the work done has since left the state, with an unpaid balance, and he has turned the car back to his father, who refuses to pay this account. Is the above car good for the account? Where can we find the law in regard to 1, 2 and 3?

3—Your statute gives a lien against the property, but it presupposes that the owner orders the repairs done. However, from the nature of your lien and its enforcement under the Mississippi statutes, we are of the opinion that your lien is good against the car in the father's hands, since his knowledge precludes his denial, so that he may not say that he stands in the shoes of a buyer or possessor without notice of the lien.

Further, the father may not say that this is a purely personal obligation, for the statute gives a lien on all personal property repaired. You may find the statutory law bearing on the liens in Hemingway's Annotated Mississippi Code, 1917, sections 2435, 2436, 2437, 2438, and the citations therein given. Besides,

there are the general rules of law applicable, and necessary to explain the construction.

4—Please print a form in the nature of a statement which will be a promissory note and serve as an acknowledgment of the debt.—Mississippi Reader.

4—You could have printed on the body of your statements or bills, near the end where the customer could sign his name, the following:

I hereby acknowledge the above charges amounting to \$..... to be true and just, and hereby promise to pay the same to ....., his successors or assigns, not later than .....

(Signed) .....

This will be an admission of debt and a promise to pay—a promissory note, in fact.

### PREMIER SPECIFICATIONS CONDENSED

Q—Tell me the original sales price for the Premier model 6-B, 1917 model, seven passenger car.

1—The list price of the 1917 series 6-B seven passenger touring car was \$1895.

2—Tell us the hp. rating and other specifications.—H. C. Taylor, Enid, Okla.

2—The specifications of this car are as follows:

Number of cylinders, 6.  
Bore and stroke in inches,  $3\frac{3}{8} \times 5\frac{1}{2}$ .  
Piston displacement in cubic inches, 295.3.

Gear ratio on direct drive, 4.45 to 1.  
Make of engine, Premier.  
Camshaft drive, Helical gear.  
Water circulation, centrifugal pump.  
Lubrication system, splash pressure.  
Type of oil pump, Gear.  
Generator make, Delco.  
Voltage, 6.  
Ignition, Delco.  
Control, Automatic.  
Make of carburetor, Johnson.  
Type of clutch, Plate.  
Location, Unit power plant.  
Final drive, Spiral bevel.  
Rear axle type, Semi-floating.  
Make of rear axle, Timken.  
Wheelbase,  $125\frac{1}{2}$  inches.  
Make of speedometer, Warner.  
Number of crankshaft bearings, 3.  
Type of bearings in transmission, Ball and Plain.  
Type of bearings in rear axle, Roller.  
Type of bearings in front axle, Roller.

### FRONT MAIN TAKES THRUST IN 7R CONTINENTAL

Q—Advise us how to take up end play in a 7R Continental engine.—Leo Legner, White Plains, N. Y.

1—The fore and aft location of the crankshaft is determined by two shoulders, one in front and one at the rear of the front main bearing. When end play develops it is due to wear in the bearings and the condition is corrected by replacing the bearing. Both the upper portion which fits in the crankcase and the lower portion which fits in the bearing cap should be replaced.

# BOOSTING ACCESSORY SALES

THE tourist, whether he is planning a short or long tour, is the liveliest accessory prospect that you have. Why not get up a tourists' accessory department and feature several things that will go especially well with the motor camper or outer? It is not hard to arrive at a group of accessories which will be necessities for the man on the road and he will probably appreciate your effort to help him in selecting what he needs.

A durable metal carrier for spare spark plugs has been brought out by the Champion Spark Plug Company of Toledo and is now being distributed to the trade.

The container is known as the Champion Service Kit and is made in two sizes—for four and six Champion plugs.

Traf-i-kop is a semi-automatic device which attaches to the left front and rear fenders of automobiles and by which the driver can clearly signal his intention to turn right or left, continue straight ahead or stop. It is the product of the Motor Products Co., Norwalk, O.

The Ford Faithful Oiling System, which is made by the W. O. Thompson Mfg. Co., Pasadena, Cal., was designed to eliminate lack of lubrication in the Ford motor and transmission. Oil is gathered in a large pocket which is an integral part of the special inspection plate, where it is delivered to the forward end of the motor through a large exterior tube, the angle of which is sufficient to assure adequate lubrication, regardless of driving conditions. The pocket in the inspection plate is so perforated as to throw a steady stream of oil over the transmission bands at all times. The Ford Faithful Oiling System retails at \$5.75, installed.

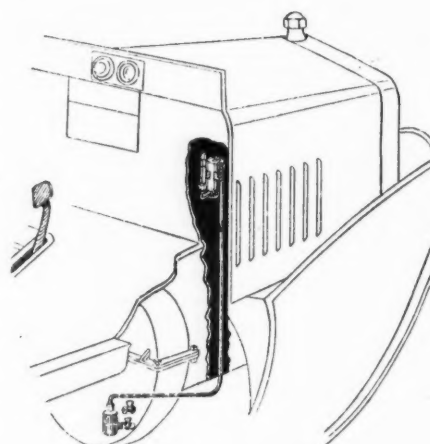
The Hykon Luggage Carrier is made by the Hykon Mfg. Co., Alliance, O., and sells for \$1.50. It is made of steel with jet black finish and each carrier contains five foot water-proofed webbing, one inch wide, sufficient for two ordinary suitcases. It is attached permanently under the runningboard and an automatic locking feature holds the webbing tight when holding suitcases or other luggage on the runningboard.

The Columbus McKinnon Chain Co., maker of Dreadnaught Tire Chains, announces that all Dreadnaught Tire Chains now in production will have the size of chain distinctly stamped on the lever lock fastener. This improvement is in keeping with the Columbus McKinnon Company's program of doing everything that can possibly be done to make it easier for the user to secure the proper size chain for his car.

The Ken-Nite Co., Detroit, Mich., has placed on the market an automobile polish which, they claim, is free from oil and will not hold dust.



Traf-i-kop



Simplex oil gage

The new Crescent Kit consists of three tools, a Crescent wrench, a Crescent plier and a Crescent screwdriver. The screwdriver is a special type, the handle of which can be locked into T position, giving somewhat more than the leverage of some other screwdrivers. Crescent Tool Co., Jamestown, N. Y.

The kit is packed in a stout brown duck container, which folds up into so small a space that the whole thing can be easily carried in the pocket, or in the side pocket of a car. The kit retails at \$2.35.

The Simplex Oil Gage is made for Ford and Chevrolet cars. Its attachment to cars is shown in the cut. The price is \$4.50 and it is made by the Schneider Sales Corp., 907 Pine street, St. Louis, Mo.

The Duplex Second Spare Tire Carrier and Rim Tool, when used as a tire carrier, is attached to the spare tire carrier, from which it can easily be removed for use as a rim contractor or expander. Re-



Schrader universal valve fishing tool



Markwell spring



Duplex second spare tire carrier and rim tool

tail price is \$5. International Stamping Co., 400 N. Leavitt street, Chicago.

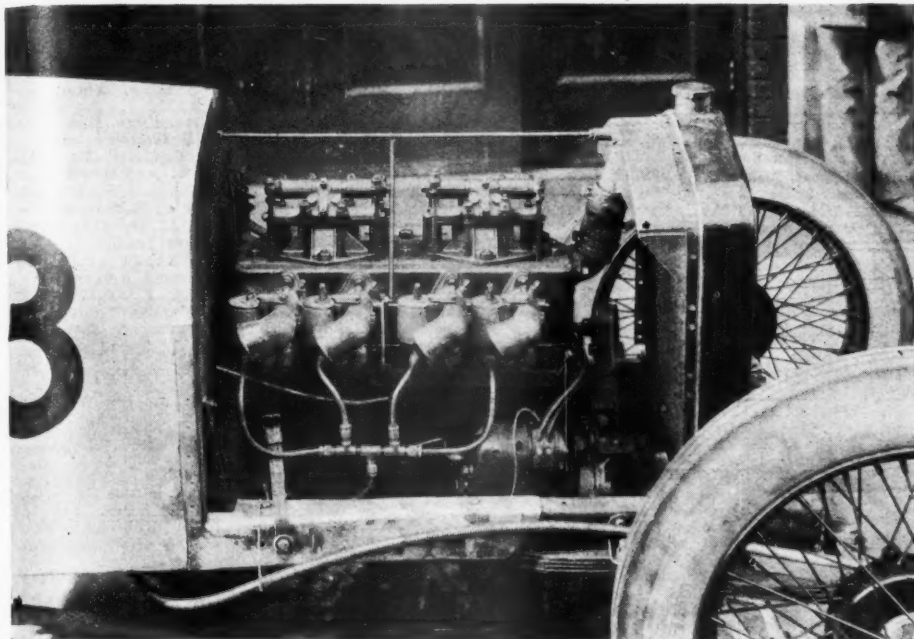
The Libby Mfg. Co., Plainfield, N. J., announces a new brake lining known as Libestos.

The Markwell Spring for Ford cars is an auxiliary spring that works opposite the main spring with a lever pinch arm which makes an effective shock absorber. The cut shows the Markwell spring attached to the front spring of a Ford car. Markwell Mfg. Co., Denver, Colo., is the manufacturer.

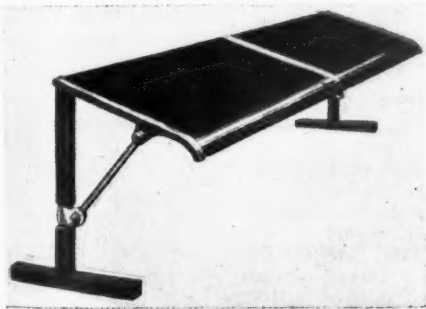
A. Schrader's Son, Inc., Brooklyn, N. Y., has placed on the market a contrivance called the Schrader Universal Valve Fishing Tool by the use of which the valve on a tire is drawn into place after the tire has been placed on the rim, particularly designed for truck tires, it is attached to the valve stem after the tube has been inserted in the casing, the cross bar is dropped through the rim and the valve stem drawn into position. The price, retail, is 75 cents.



# BOOSTING ACCESSORY SALES



Laurel Motors' Type C Racing head for Fords



Buffalo visor



Krafve mixer manifold

A SOMEWHAT novel accessory display for the oiling and greasing station would be to bring the wares out in full view for the customer. A great many sales are lost because the man who "Asks 'Em to Buy" hasn't got his material at hand. For the garage that can arrange it, an accessory display beside the gas pump outside should prove a good stimulant to sales. If there is no way of getting the accessory showcase outside, then at least have it represented in the window.

The Laurel Motors Corp. of Anderson, Ind., is now offering its new racing Ford 16-valve head, Type C, the latest design of its chief engineer, Robert M. Roof. This cylinder head is a radical departure in many respects from previous Roof designs and is intended for racing only.

The head is somewhat larger and higher than previous types and has four 1½-in. intake ports and four 2¼-in. exhaust ports. Venturi design of the intake ports in connection with the bridge in port increases the velocity and turbulence of the incoming gases and there

can be no banking. The intake port is of ample size to furnish sufficient gas for the larger size valves used. The bridge in the exhaust port forces gas flames direct to the exit.

The most liberal allowance in water jacket space is provided. All valves and spark plugs are water jacketed and there is water above and below the valve ports. On account of the interior design of the head, it will be impossible for steam pockets to exist. Four 1¼-in. carbureters are used, controlled by a single lever. The rocker arm system is of a light aeroplane type, and all oscillating parts on the rocker arm system are machined to an extreme nicety.

The rocker arm shafts are hollow and filled with oil through Alemite oilers, giving positive and unfailing rocker arm shaft lubrication. Rocker arms and brackets are drop-forged steel and the rocker arms can be removed and the entire rocker arm system disassembled in five minutes by withdrawing two ⅝-in. cap screws. The push rods have ball and socket joint with adjustment on top. Sixteen 1¼-in. Tungsten valves are

used with hardened valve spring caps turned from bar stock and caps are locked with 3/32x1/4-in. keys.

Universal valve extensions operate between rocker arms and valve stems preventing side wear on stems, and although the valves are offset, it is not necessary to remove the valve stem bushings in order to take the valves out. Seven-eighths in. A. L. A. M. spark plugs are standard.

The company is also building for general distribution a complete racing Ford power plant carrying Type C cylinder head equipment, with four carbureters and magneto ignition, high speed camshaft, special hollow crankshaft with 1½-in. main bearings, crankshaft having pressure feed oiling system, light weight pistons and connecting rods and flywheel reduced to 8¾ in. in diameter. An aluminum oil pump of three gallons capacity is provided, the sump cover being ribbed to cool the oil.

The Buffalo visor is the product of the Buffalo Forge Co., Buffalo, N. Y., and it retails at \$7.50. The cut shows the display rack with which the dealer is furnished. It also shows details of the bracket and mounting used on open cars and the rain gutter at the front of the shield. They are made for all types of cars.

The National Carbon Co., Inc., Long Island City, N. Y., has put on the market a new and powerful flashlight capable of throwing a penetrating electric beam a distance of 500 feet. This light is called the "Eveready Focusing Searchlight" and is said to be the most intense light concentrated in a flashlight for popular use—three thousand candle power at the focal point in a broad beam of light.

The Eveready Focusing Searchlight can be obtained in either a nickle or vulcanized fiber case. Both types are equipped with a shock absorber to protect the lamp, have an octagonal non-rolling lens ring, flash and permanent contacts and also have one extra lamp installed in the bottom cap.

The Multibestos Co., Walpole, Mass., has introduced two new products, both for use in the Ford field. One is Multibestos 229, which is a woven cotton transmission lining put up both in sets and in 50 and 100 foot rolls. The other is the Multibestos Fibre transmission lining for Ford trucks, and is made of pure asbestos fibre, highly compressed and supported by a thin brass lining.

The regular Ford intake manifold is taken off, together with the carburetor, and bolted onto the Krafve Mixer Manifold, shown in the cut. It is then clamped back onto the cylinder, just as the Ford intake is. Among the many things claimed for the Krafve Mixer Manifold are quicker starting in cold weather, smoother running, and more mileage. The price is \$5 and it is made by the Krafve Automotive Corp., Worcester, Mass.

# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Red Bank, N. J.	Eighth Annual Show	May 7-12
New York	Spring Automobile Salon, Hotel Commodore	May 13-20
Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Sacramento	Annual Automobile Show	Sept. 3-6
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Waco, Texas	Waco Automobile Dealers' Assn.	Oct. 20-Nov. 5
New York	Salon at the Hotel Astor	Nov. 4-10

## RACES

Indianapolis	Annual 500 Mile International Sweepstakes	May 30
Tours, France	Grand Prix 500 Mile Race	July 2

## CONVENTIONS

New York	National Highway Traffic Association, Automobile Club of America	May 10
Detroit	Spring Convention of Service Managers' Division of National Automobile Chamber of Commerce	May 15-16
Spring Lake, N. J.	Summer Meeting of the Society of Automotive Engineers	June 19-23
Dixville Notch, N. H.	Summer Meeting of the Automotive Equipment Association	June 25-July 1
Olympia, Wash.	Convention Washington Automotive Trade Association	July
Mobile, Ala.	Semi-Annual Meeting of the Alabama Automotive Trades Association	July 23
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17

# SQUEEKS & RATTLES

If You Know Any, Tell Them to Us

## Gypped

The other day a friend of ours told us his sad tale, If he could only have his way, a dealer'd be in jail. It seems he went to have a job, done on his motor car, And when he got the darned thing out, it wasn't up to par. He paid a bill of forty bucks and lightly out he tripped, Around the block, a motor knock—curses, he'd been gypped! He fooled around and fooled around and fooled around some more,

And back he went, his patience spent, believe us he was sore. He cussed and fussed and shouted loud, he wasn't any sap, The dealer'd do the job up right, or he would make him yap. And then with slimy fingers, the dealer locked the hood, Our friend went out, with joyous shout, his motor running good!

Moral: Do all of the work on the car, even to tightening the hood down when you're through, because car owners can be dumb sometimes if they want to.

—Low Brication.

## Why Some Garagemen Go Crazy



Copr. Life Pub. Co.

"Yer car needs gas, Mister."

"That car had five gallons of gas yesterday and that's every dam' drop it's going to get till tomorrow!"

## Dumbbells I Have Met

A guy we chinned with the other night said he was going to buy a car. "What kind?" we asked. "A Nash," said he, "because I can drive it from Nashville when I go there next week and save freight charges."

Won't he be sore, though?

The Milwaukee Sunday Journal boasts a perspiring reporter. We print here a startling view, given by car owners, regarding gasoline. This will very likely prove a sensation when aired in Squeeks & Rattles. We believe that the trade should promote the use of gasoline in automobiles. We believe that this power agency has it on the world. A certain individual, named John D. Rockefeller, is reported as having made \$60 last week alone, selling this stuff at his service station. As usual, Squeeks & Rattles readers are given the low-down on this revelation first.

## OUR NOSEY REPORTER

Every Saturday night he gets wild and questions four able-bodied citizens.

### HIS QUESTION

Do you use gas in your automobile?

### WHERE ASKED

The Morgue, 679 Market street.

### THE ANSWERS

Herbert Tareyton, Jones Island, shrimp salesman: Yes, I find I get more mileage out of my car with gas than I ever did with castor oil. Since the castor bean has arose in price, I find this noted power agent too high for my purse. I am for gas for automobiles.

Jack Lightfoot, Madison, U. of W. high jumper: For speed and hill climbing ability I find my four-gear flivver runs best on gasoline. But for doing cross-country work in the great desert stretches near Adams, I prefer a mixture of gas and helium to take me over the sandy areas. Do not use my name for publicity purposes with any one make of gas.

Lulu Lukewarm, Piggsville, society matron: Really, I hesitate to say what I think of gas as a motive power, but my chauffeur has poured it constantly into our car for three years and our car still runs—so I guess it is all right. I am not up on these technical matters, but can understand where the gas we put in goes to. I believe a gas should be invented having better staying powers.

Thomas Tubbs, Wauwatosa, laundryman: I use gas first, last and every time and have no belief in the new power agencies such as alcohol. I know what alcohol did to my father, so why try it on a weak car like I have. Gas is a gift from nature, aided, of course, by the oil companies. Who knows where alcohol comes from nowadays? I don't.

## Requiescat

In this spot

## JONAS MC FUDDLE

would have been buried in due time. But he tossed a match into a tank of gasoline to see if it would ignite.

## IT WOULD

## Fable

Once there was a mechanic, who, after removing, inspecting and installing the whim-wham on an average automobile, using a magnetic screwdriver, a stepladder and a telescope, sat down and wrote the factory congratulating them on the wonderful ability of their designers for simplification. (Mostly simplification.) —U. Tellem.



## Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive
Ace.....30 1 1/2	11 1/2	\$2550	Mi-412	3 1/2 x 5	B-L	B-L	Ti-6560	WO.
Ace.....40 2 1/2	13 1/2	3100†	Mi-402	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO.
Ace.....60 3	17 1/2	3700†	Mi-402	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Acme.....20 1 1/2	11 1/2	.....	Co-N	3 1/2 x 5	B&B	Cot.	Ti-6250	WO.
Acme.....30 1 1/2	11 1/2	.....	Co-N	3 1/2 x 5	B&B	Cot.	Ti-6352	WO.
Acme.....40 2 1/2	13 1/2	.....	Co-J4	3 1/2 x 5	B&B	Cot.	Ti-6460	WO.
Acme.....60 3	17 1/2	.....	Co-K4	4 1/2 x 5 1/2	B&B	Cot.	Ti-6460	WO.
Acme.....90 3 1/2	21 1/2	.....	Co-L4	4 1/2 x 5 1/2	B&B	Cot.	Ti-6660	WO.
Acme.....125 5 1/2	25 1/2	.....	Co-B5	4 1/2 x 6	B&B	Cot.	Ti-6760	WO.
Armleder.....20 1 1/2	11 1/2	.....	Bu-CTU	3 1/2 x 5	Ful.	Ful.	Ti-6460	WO.
Armleder.....HWB 2 1/2	13 1/2	.....	Bu-HTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Armleder.....HWC 2 1/2	13 1/2	.....	Co-C4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Armleder.....KWB 3 1/2	17 1/2	.....	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO.
Armleder.....KWC 3 1/2	17 1/2	.....	Co-E4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.
Atlas.....22 1	11 1/2	1495	Bu.....	3 1/2 x 5 1/2	M&E	Own.	WO.	34x4 1/2
Atlas.....44 1 1/2	15 1/2	1950	Bu.....	3 1/2 x 5 1/2	M&E	Own.	WO.	36x6
Atterbury.....20R 1 1/2	11 1/2	2175	Co-J4	3 1/2 x 5	Ful.	Ful.	Ti-6460	WO.
Atterbury.....22C 2 1/2	13 1/2	2375b	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Atterbury.....22D 3 1/2	17 1/2	4275b	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6660	WO.
Atterbury.....8E 5 1/2	25 1/2	4975b	Co-B2	4 1/2 x 6	B-L	B-L	Ti-6760	WO.
Autocar.....2 1 1/2	11 1/2	2200†	Own.	.....	.....	.....	DR.	34x4
Autocar.....27 2 1/2	15 1/2	3100†	Own.	.....	.....	.....	DR.	34x4
Autocar.....26 4	14 1/2	4200†	Own.	.....	.....	.....	DR.	34x4
Available.....JH 1 1/2	11 1/2	2150	He-O	4 1/2 x 5	B-L	B-L	Ti-6460	WO.
Available.....H 2 1/2	13 1/2	3160	He-CU3	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Available.....H 3 1/2	17 1/2	4175	He-MU3	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.
Available.....H 5	21 1/2	5375	He-T3	5 1/2 x 6	B-L	B-L	Ti-6760	WO.
Avery.....1-1 1/2	11 1/2	.....	Own.	.....	.....	.....	IG.	34x5n
Bessemer.....G 1	1450	Co-N	3 1/2 x 5	Ful.	Ful.	To-A	IG.	35x5n
Bessemer.....H2 1 1/2	15 1/2	1995	Co-N	3 1/2 x 5	B&B	Bak.	LM-7150	DR.
Bessemer.....H2 2 1/2	15 1/2	2895	Co-C2	4 1/2 x 5 1/2	B&B	B-L	LM-7250	DR.
Bessemer.....K2 1	1495	Co-E7	4 1/2 x 5 1/2	B&B	B-L	To-E	IG.	36x5
Bethlehem.....KN 1	1385	Own.	3 1/2 x 5	B&B	Det.	Ea-3070	SB.	35x5n
Bethlehem.....GN 2	2185	Own.	4 1/2 x 5 1/2	B&B	Det.	Wi-60A	DR.	34x4
Bethlehem.....HN 3	2985	Own.	4 1/2 x 5 1/2	Ful.	Ful.	Wi-88E	DR.	34x4
Brockway.....E2 1	11 1/2	.....	Wi-SU	4 1/2 x 5	B-L	B-L	Co-52001	SB.
Brockway.....S 1 1/2	11 1/2	.....	Wi-SU	4 1/2 x 5	B-L	B-L	Ti-6460	WO.
Brockway.....K 2 1/2	13 1/2	.....	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.
Brockway.....R 3 1/2	17 1/2	.....	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.
Brockway.....T 5	21 1/2	.....	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO.
Buick.....23-4-SD 3 1/2	945	Own.	.....	.....	.....	.....	SB.	31x4n
Case.....TR 2	.....	Own.	.....	.....	.....	.....	.....	.....
Cherrollet.....G 3 1/2	650	Own.	.....	.....	.....	.....	.....	.....
Cherrollet.....T 1	1095	Own.	.....	.....	.....	.....	.....	.....
Clydesdale.....10	1485	Co-N	3 1/2 x 5	B&B	B-L	Ti-5511	SB.	34x5n
Clydesdale.....8	2650†	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO.	36x4
Clydesdale.....6	3650†	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x5
Clydesdale.....4	4300†	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6660	WO.	36x6
Clydesdale.....2	4750†	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x7
Commerce.....9 1/2	.....	Co-N	3 1/2 x 5	Det.	Det.	Sa-D16	SB.	32x4 1/2
Commerce.....14 1 1/2	.....	Co-J4	3 1/2 x 5	B-L	B-L	Ti-6560	WO.	36x3 1/2
Commerce.....25 2 1/2	.....	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4 1/2
Corbitt.....S 3 1/2	1250	HS-700	3 1/2 x 5	B-L	B-L	Sh-100	WO.	34x4 1/2
Corbitt.....E 1	1180	Co-N	3 1/2 x 5	B-L	B-L	Sh-100	WO.	34x4 1/2
Corbitt.....D 1 1/2	2200	Co-J4	3 1/2 x 5	B-L	B-L	Sh-150	WO.	34x4 1/2
Corbitt.....C 2	2600	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO.	36x3 1/2
Corbitt.....B 2 1/2	3000	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-21	WO.	36x4
Day-Elder.....AS 1-1 1/2	1600	Co-N	3 1/2 x 5	B-L	B-L	Sh-1001	WO.	35x5n
Day-Elder.....B 1 1/2	2000	Co-N	3 1/2 x 5	Cov.	Cov.	Sh-1500	WO.	34x3 1/2
Day-Elder.....D 2 1/2	1400	Co-C2	4 1/2 x 5 1/2	Cov.	Cov.	Sh-103	WO.	36x4
Day-Elder.....C 2 1/2	2750†	Bu-HTU	4 1/2 x 5 1/2	Cov.	Cov.	Sh-21	WO.	36x4
Day-Elder.....F 3 1/2	3150†	Co-E4	4 1/2 x 5 1/2	B-L	B-L	Sh-31	WO.	36x5
Day-Elder.....E 5 1/2	4250	Bu-YU	4 1/2 x 6	B-L	B-L	Sh-51	WO.	36x5
Dearborn.....E 1	1600†	Bu-Mu	3 1/2 x 5 1/2	Ful.	Ful.	Wi.....	WO.	35x5n
Dearborn.....F 1 1/2	1980†	Bu-WU	3 1/2 x 5 1/2	Ful.	Ful.	Wi.....	WO.	34x4
Dearborn.....48 2	2390	Bu-WU	3 1/2 x 5 1/2	Ful.	Ful.	Wi.....	WO.	34x4 1/2
Defiance.....G 1 1/2	1525	Co-N	3 1/2 x 5	B&B	G-L	Ea-1000	SB.	35x5n
Denby.....31 3 1/2-1 1/2	1485	Co-N	3 1/2 x 5	Ful.	Ful.	Cl-B300	SB.	34x5n
Denby.....33 2	2375	Co-J4	3 1/2 x 5	Ful.	Ful.	Cl-1D	IG.	35x5n
Denby.....35 3	2975	Co-J4	3 1/2 x 5	Ful.	Ful.	Cl-2D	IG.	36x4
Denby.....27 1	3695	Co-K4	4 1/2 x 5 1/2	Ful.	Ful.	Cl-3D	IG.	36x5
Denby.....210 5	4295	Co-L4	4 1/2 x 5 1/2	Ful.	Ful.	Cl-5D	IG.	36x6
Dependable.....CD 1 1/2	2350	Bu-CTU	3 1/2 x 5 1/2	Ful.	Ful.	Wi-800J	WO.	34x5
Dependable.....EG 2 1/2	2950	Bu-ETU	4 1/2 x 5 1/2	Ful.	Ful.	Wi-900C	WO.	36x5
Diamond T.....O3 1-1 1/2	1975	Hi-700	3 1/2 x 5 1/2	Cov.	Cov.	Own.	WO.	36x3 1/2
Diamond T.....T 1 1/2	2250	Hi-700	3 1/2 x 5 1/2	Cov.	Cov.	Ti-6460	WO.	36x3 1/2
Diamond T.....U 2 1/2	2650	Hi-1400	4 1/2 x 5 1/2	Cov.	Cov.	Ti-6560	WO.	36x4
Diamond T.....K 3 1/2	3750	Hi-1500	4 1/2 x 5 1/2	Cov.	Cov.	Ti-6666	WO.	36x5
Diamond T.....EL 5	4325	Hi-200	4 1/2 x 5 1/2	Cov.	Cov.	Ti-6760	WO.	36x6
Diamond T.....S 5	4500	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x6
Dodge Brothers.....3 1/2	750	Own.	.....	.....	.....	.....	SB.	32x4n
Dorris.....K-4 2 1/2	3400	Own.	.....	.....	.....	.....	WO.	36x4
Dorris.....K-7 3 1/2	4400	Own.	.....	.....	.....	.....	WO.	36x7
Dort.....199 1 1/2	685b	Ly-K	3 1/2 x 5	Del.	Own.	FI-105	SB.	31x4n
Double Dr. DFT 3	4000	Bu-ETU	4 1/2 x 5 1/2	B&B	Own.	Own.	WO.	36x6
Duplex.....A 2	2775	Hi-400	4 1/2 x 5 1/2	Cov.	Cov.	Sh-103	WO.	35x5n
Duplex.....E 3 1/2	3500	Bu.....	4 1/2 x 5 1/2	B-L	B-L	Own.	IG.	36x8
Eagle.....190 2	2275†	Bu-CTU	3 1/2 x 5 1/2	Co-N	Cov.	Ru-6000	IG.	34x4 1/2

\*—Make Optional  
†—Short wheelbase model  
‡—6 cylinders  
§—All 4 cyl. engines unless otherwise specified  
††—Truck Tractor  
b—price includes body or cab  
d—dual  
k—pneumatic tires optional at extra cost  
n—pneumatic tires standard

ENGINE:  
Bu—Buda  
Co—Continental  
Do—Dodge  
He—Hercules  
Hi—Hinkley  
HS—Herschell-Spiller  
Ly—Lycorning  
MI—Midwest  
Wa—Waukesha  
We—Weidely  
Wi—Wisconsin

CLUTCH & GEARSET  
B&B—Borg & Beck  
B-L—Brown-Lape  
Bak—Baker  
Cam—Campbell  
Cot—Cotta  
Cov—Covert  
Del—Dethaff  
Det—Detroit  
Ful—Fuller  
H-S—Holt-Shaw  
Hoo—Hoosier  
M&E—Merchant & Evans

Mec—Mechanics  
Mun—Muncie  
T. D.—Twin Disc  
War—Warner

REAR AXLE:  
Am—American  
Cl—Clark  
Co—Columbia  
Du—Duron  
Ea—Eaton  
Fl—Flint  
LM—L-M

Ru—Russell  
Sa—Salsbury  
Sh—Sheldon  
TI—Timken  
To—Torbenzen  
Wa—Walker  
Wi—Wisconsin  
Ch—Chain  
DR—Double Reduction  
IG—Internal Gear  
SH—Spiral Bevel  
SP—Straight Bevel  
WO—Worm

# Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Larrabee...X2	1-1 1/2	\$1865	Co-8R...	3 3/4x4 1/2	B-L	B-L	Sh-1480	SB...	34x5n	34x5n
Larrabee...J4	1-1 1/2	2400	Co-J4...	3 3/4x5	B-L	B-L	Sh-1501	WO...	34x3 1/2	34x5k
Larrabee...K5	2-2 1/2	3400	Co-LA...	4 1/2x5 1/2	B-L	B-L	Sh-22...	WO...	36x4	36x8
Larrabee...L4	3-4 1/2	4000	Co-LA...	4 1/2x5 1/2	B-L	B-L	Sh-31...	WO...	36x5	36x10
Maccar...L2	1 1/2		Co-K4...	4 1/2x5 1/2	B-L	B-L	Ti-6160	WO...	36x4	36x6
Maccar...HA2	1 1/2		Co-K4...	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO...	36x4	36x4d
Maccar...H23	1 1/2		Co-L4...	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO...	36x5	36x5d
Maccar...M34	1 1/2		Co-LA...	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO...	36x5	36x6d
Maccar...G5-6	1 1/2		Co-B2...	4 1/2x6	B-L	B-L	Ti-6760	WO...	36x5	36x6d
MacDonald...A7 1/2	1 1/2	5750	Bu...	4 1/2x6	B-L	B-L	Own...	IG...	40x7	40x14
Mack...AB 1 1/2	1 1/2	3000	Own...	4x5	Own	Own	Own...	DR...	36x4	36x3 1/2
Mack...AB 1 1/2	1 1/2	3450	Own...	4x5	Own	Own	Own...	DR...	36x4	36x4d
Mack...AB 2	2	3300	Own...	4 1/2x5	Own	Own	Own...	DR...	36x4	36x4d
Mack...AB 2	2	3750	Own...	4 1/2x5	Own	Own	Own...	DR...	36x4	36x4d
Mack...AB 2 1/2	2 1/2	3400	Own...	4 1/2x5	Own	Own	Own...	DR...	36x4	36x4d
Mack...AB 2 1/2	2 1/2	3850	Own...	4 1/2x5	Own	Own	Own...	DR...	36x4	36x4d
Mack...AC 3 1/2	3 1/2	4950	Own...	5x6	Own	Own	Own...	DR...	36x6	40x6d
Mack...AC 3 1/2	3 1/2	5503	Own...	5x6	Own	Own	Own...	DR...	36x6	40x6d
Mack...AC 6 1/2	6 1/2	5753	Own...	5x6	Own	Own	Own...	DR...	36x7	40x7d
Mack...AC 7 1/2	7 1/2	6003	Own...	5x6	Own	Own	Own...	DR...	36x7	40x7d
Mack...AB 5	5	3400	Own...	1 1/2x5	Own	Own	Own...	DR...	36x5	40x5d
Mack...AC 7	7	4950	Own...	5x6	Own	Own	Own...	DR...	36x6	40x6d
Mack...AC 10	10	5500	Own...	5x6	Own	Own	Own...	DR...	36x6	40x6d
Mack...AC 13	13	5750	Own...	5x6	Own	Own	Own...	DR...	36x7	40x7d
Mack...AC 15	15	6000	Own...	5x6	Own	Own	Own...	DR...	36x7	40x7d
Mason...H 1 1/2	1 1/2	1200	He...	1x5	Hoo	War	FL...	SB...	34x5n	34x5n
Master...JW 1 1/2	1 1/2	2290	Bu-OU...	4 1/2x5 1/2	Ful	Ful	Ti-6460	WO...	34x4	34x4
Master...DD 2 1/2	2 1/2	3190	Bu-HU...	4 1/2x5 1/2	Ful	Ful	Wa-25A	IG...	34x4	36x8
Master...W 2 1/2	2 1/2	2890	Bu-HU...	4 1/2x5 1/2	Ful	Ful	Ti-6560	WO...	34x4	36x8
Master...A 3 1/2	3 1/2	3990	Bu-YTU...	4 1/2x6	B-L	B-L	Ti-6666	WO...	36x5	40x5d
Master...B 5	5	4990	Bu-ATU...	4 1/2x6 1/2	B-L	B-L	Ti-6760	WO...	36x6	40x6d
Master...F 5	5	5090	Bu-ATU...	4 1/2x6 1/2	B-L	B-L	Wa-5A...	IG...	36x6	40x6d
Maxwell...H 1 1/2	1 1/2	932	Own...	3 3/4x5 1/2	Own	Own	Own...	DR...	36x5	36x5n
Menominee...B 1	1	1650	Wi-SU...	4x5	B&B	Det.	Co-5200	SB...	36x5	36x5n
Menominee...HT 1 1/2	1 1/2	2000	Wi-FAU...	3 3/4x5	Ful	Det.	Wi-800G	WO...	34x3 1/2	36x5k
Menominee...H 1 1/2	1 1/2	2475	Wi-EAU...	4x5	Ful	Det.	Wi-800H	WO...	36x3 1/2	36x5k
Menominee...D 2 1/2	2 1/2	2775	Wi-TAU...	4x6	Ful	Det.	Wi-800J	WO...	36x4	36x8
Menominee...J 5	5	4850	Wi-RAU...	4 1/2x6	B&B	Det.	Ti-6760	WO...	36x6	40x12
Moline...10 1 1/2	1 1/2	1695	Own...	3 3/4x5	B&B	Own	To-A...	IG...	34x5n	34x5n
Moreland...R.R. 1 1/2	1 1/2	1595	He-O...	4x5	B-L	B-L	Ti-5512	WO...	34x5	34x5n
Moreland...BX 1 1/2	1 1/2	1980	He-O...	4x5	B-L	B-L	Ti-6161	WO...	36x3 1/2	36x6
Moreland...EX 2	2	2625	Co-K4...	4 1/2x5 1/2	Own	Own	Ti-6161	WO...	36x4	36x8
Moreland...AX 3	3	3500	Co-L4...	4 1/2x5 1/2	Own	Own	Ti-6560	WO...	36x5	36x10
Moreland...RX 5	5	4600	Co-B5...	4 1/2x6	Own	Own	Ti-6666	WO...	36x6	40x12
Nash...2018	1-1 1/2	1595	Own...	3 3/4x5 1/2	B&B	Det.	Cl-ID...	IG...	34x4	34x5
Nash...4017F	2-2 1/2	2750	Bu-HU...	4 1/2x5 1/2	B&B	Own	Own...	IG...	34x6	36x6
Nash...3018	2-2 1/2	2150	Own...	3 3/4x5 1/2	B&B	Det.	Cl-2D...	IG...	34x4	34x7
Nash...5018	2-2 1/2	2250	Own...	3 3/4x5 1/2	B&B	Det.	Cl-2D...	IG...	34x4	34x7
Noble...A-21	1-1 1/2	1750	Bu-MU...	3 3/4x5 1/2	Ful	Ful	Sh-1501	WO...	34x5n	34x5n
Noble...B-31	1 1/2	2395	Bu-CTU...	3 3/4x5 1/2	Ful	Ful	Sh-103	WO...	36x4	36x7
Noble...D-51	2 1/2	2795	Bu-HTU...	4 1/2x5 1/2	Ful	Ful	Sh-21...	WO...	36x4	36x8
Noble...E-71	3 1/2	3495	Bu-YTU...	4 1/2x6	Ful	War	Sh-30...	WO...	36x5	36x10
Old Reliable...B 2 1/2	2 1/2	3500	Wi-UAU...	4 1/2x6	Ful	Ful	Sh-21...	WO...	36x5	36x12
Old Reliable...C 3 1/2	3 1/2	4250	Wi-UAU...	4 1/2x6	Ful	Ful	Sh-31...	WO...	36x6	40x12
Old Reliable...D 5	5	5000	Wi-RAU...	4 1/2x6	Own	B-L	Sh-51...	Own	Ch...	40x14
Old Reliable...K 7 1/2	7 1/2	6000	Wa-P...	4 1/2x6 1/2	Own	Own	Own...	Ch...	36x6	40x14
Oldsmobile...T 1	1	1095	Own...	3 1/2x5 1/2	B&B	War	To-0X2	IG...	35x5n	36x7
Oneida...A-21 1/2	1 1/2	2825	Hi-400...	4x5 1/2	Ful	Ful	Wi-800J	WO...	36x3 1/2	36x8
Oneida...C 2 1/2	2 1/2	3200	Hi-400...	4x5 1/2	Ful	Ful	Wi-900C	WO...	36x4	36x7
Oneida...D 3 1/2	3 1/2	4050	Hi-200...	4 1/2x5 1/2	Ful	Ful	Ti-6652	WO...	36x5	36x10
Overland...AD 3 1/2	3 1/2	425	Own...	3 3/4x4	B&B	Own	Own...	SB...	36x3 1/2	36x3 1/2
Packard...EC 2-3	2-3	3100	Own...	4 1/2x5 1/2	Own	Own	Own...	WO...	36x4	36x7
Packard...EX 2 1/2	2 1/2	3500	Own...	4 1/2x5 1/2	Own	Own	Own...	WO...	36x6n	40x8n
Packard...ED 3-5	3-5	4100	Own...	4 1/2x5 1/2	Own	Own	Own...	WO...	36x5	36x5d
Packard...EF 5-7	5-7	4500	Own...	5x5 1/2	Own	Own	Own...	WO...	36x6	40x6d
Paige...52-19 1 1/2	1 1/2	1950	Hi-400...	4x5 1/2	B-L	B-L	Ti-6160	WO...	34x4	34x8
Paige...54-20 2 1/2	2 1/2	2420	Hi-500...	4 1/2x5 1/2	B-L	B-L	Sh-21...	WO...	34x4	34x8
Paige...51-18 3 1/2	3 1/2	3145	Hi-200...	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO...	36x5	36x5d
Patriot, Revere...1	1	1295	Co-N...	3 3/4x5	B&B	Cov.	Du-B...	WO...	35x5n	35x5n
Patriot, Lincoln...2	2	2300	Hi-400...	4x5 1/2	Cov.	Ful	Ti-6560	WO...	34x4n	34x4n
Pat., Washington...3	3	3000	Hi-200...	4 1/2x5 1/2	Cov.	Cov.	Wi-900...	WO...	36x5n	36x8n
Pierce Arrow...X5 2	2	3200	Own...	4x5 1/2	Own	Own	Own...	WO...	36x5	36x5d
Pierce Arrow...W2 3 1/2	3 1/2	4350	Own...	4 1/2x6 1/2	Own	Own	Own...	WO...	36x5	36x5d
Pierce Arrow...R10 5	5	4850	Own...	4 1/2x6 1/2	Own	Own	Own...	WO...	36x5	40x6d
Rainier...R31	3 1/2		Co-N...	3 3/4x5	B-L	B-L	Ti-6250	WO...	35x5n	35x5n
Rainier...R29 1	1		Co-N...	3 3/4x5	B-L	B-L	Ti-6250	WO...	34x3 1/2	34x4
Rainier...R36 1 1/2	1 1/2		Co-J...	3 3/4x5	B-L	B-L	Ti-6460	WO...	34x3 1/2	34x5
Rainier...R28 2-2 1/2	2-2 1/2		Co-K4...	4 1/2x5 1/2	B-L	B-L	Sh-103	WO...	36x4	36x8d
Rainier...R20 2 1/2	2 1/2		Co-K4...	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO...	36x4	36x5d
Rainier...R25 3 1/2	3 1/2		Co-L4...	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO...	36x5	36x5d
Rainier...R27 6	6		Co-B2...	4 1/2x6	B-L	B-L	Ti-6760	WO...	36x6	40x6d
Reo...F 1 1/2	1 1/2	1185	Own...	4 1/2x4 1/2	Own	Own	Own...	SB...	34x4 1/2	34x4 1/2
Republic...7E 3 1/2	3 1/2	1395	Ly-KB...	3 1/2x5	Ful	Ful	To-750	IG...	33x5n	33x5n
Republic...10E 1	1	1795	Co-N...	3 3/4x5	Ful	Ful	To-1000	IG...	34x5n	34x5n
Republic...11X 1 1/2	1 1/2		Co-N...	3 3/4x5	Ful	Ful	To-CT2	IG...	34x3 1/2	34x6
Republic...19W 2 1/2	2 1/2		Wa-FU...	4x5 1/2	Ful	Ful	To-CT2	IG...	36x4	36x7
Republic...19 2 1/2	2 1/2	2195	Co-E2...	4 1/2x5 1/2	Ful	Ful	To-CT2	IG...	36x4	36x7
Republic...20 3 1/2	3 1/2	3095	Co-C4...	4 1/2x5 1/2	Ful	Ful	To-E...	IG...	36x5	36x5d
Rowe...CW 1 1/2	1 1/2	3000	Wi-CAU...	3 3/4x5	B-L	B-L	Sh-1501	WO...	36x6n	36x8n
Rowe...CDW 2 1/2	2 1/2	3300	Wi-EAU...	4x5	B-L	B-L	Sh-103	WO...	34x5	36x3 1/2
Rowe...CDW 2 1/2	2 1/2	4150	Wi-TAU...	4x6	B-L	B-L	Sh-21...	WO...	34x6	36x4d
Rowe...GSW 3	3	4500	Wi-UAU...	4 1/2x6	B-L	B-L	Sh-31...	WO...	36x7	36x8d
Rowe...HW 4	4	4850	Wi-UAU...	4 1/2x6	B-L	B-L	Sh-51...	WO...	36x7	40x6d
Ruggles...15 3 1/2	3 1/2	795	HS...	3 1/2x5	Own	Own	Own...	SB...	32x4 1/2	32x4 1/2
Ruggles...20R 1 1/2	1 1/2	1295	Own...	4x5	B-L	B-L	Co-5200	SB...	34x5n	34x5n
Ruggles...40 2	2	1995	Own...	4x5	B-L	B-L	Wi-65...	DR...	34x5n	34x7
Ruggles...40H 2 1/2	2 1/									



## Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES			
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	MAKE AND MODEL	Tons Capacity
Walter.....N2	3600	1500	Own.....4x5 1/2	B-L.	B-L.	Own.....DR.	36x4	36x8			CANADIAN	
Walter.....S5	5100	1640	Own.....4 1/2 x 6 1/2	B-L.	War.	Own.....DR.	36x6	40x6d				
White.....15	2400		Own.....3 3/4 x 5 1/2	Own.	Own.	Own.....SP.	34x5n	34x5n				
White.....20 1/2	3250		Own.....3 3/4 x 5 1/2	Own.	Own.	Own.....DR.	36x4	36x7d				
White.....40 3/16	4200		Own.....4 1/2 x 5 1/2	Own.	Own.	Own.....DR.	36x5	40x5d				
White.....45 1/2	4500		Own.....4 1/2 x 5 1/2	Own.	Own.	Own.....DR.	36x6	40x6d				
Wilcox.....AA1	1900		Bu-CTU 3 3/4 x 5 1/2	B-L.	B-L.	Ru-3600.	SP.	35x5	35x5			
Wilcox.....BB1	2550		Own.....4 1/2 x 5	B&B.	Own.	Wa-2A.	DR.	36x6k	38x7k			
Wilcox.....CC1	3950		Own.....4 1/2 x 5	B&B.	Own.	Wa-25A.	DR.	36x6k	40x8k			
Wilcox.....EE1	2270		Bu-YTU 4 1/2 x 6	M&F.	Own.	Wa-5A.	DR.	36x5	38x10			
Wilcox.....FF1	4350		Bu-ATU 4 1/2 x 6 1/2	M&F.	Own.	Wa-5A.	DR.	36x5	40x5			
Wilson.....EA	2825		Co-J4.....4 1/2 x 5 1/2	B&B.	Cot.	Ti-6460.	WO.	36x3 1/2	36x5k			
Wilson.....EA	3685		Co-L4.....4 1/2 x 5 1/2	B&B.	Cot.	Ti-6560.	WO.	36x4k	36x7k			
Wilson.....H5	4520		Co-B2.....4 1/2 x 6	B&B.	Cot.	Ti-6752.	WO.	36x6k	36x5dk			
Yellow Cab. M22	1590		Co-V4.....3 3/4 x 5	B-L.	B-L.	Ti-6752.	SB.	33x4 1/2	33x4 1/2			
Yellow Cab. M42	1640		Co-V4.....3 3/4 x 5	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n			
Gotfredson.....20 3/4-1	\$1685		Bu-WTU 3 3/4 x 5 1/2	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n			
Gotfredson.....40 1 1/2-2	2300		Bu-GTU 4 1/2 x 5 1/2	B-L.	B-L.	Ti-6460.	WO.	36x6n	38x7n			
Gotfredson.....50 2 1/2-3	3000		Bu-ETU 4 1/2 x 5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8			
Gotfredson.....80 4	3975		Bu-YTU 4 1/2 x 6	B-L.	B-L.	Ti-6666.	WO.	34x5	36x12			
Gotfredson.....100 5	4800		Bu-BTU 5 1/2 x 6 1/2	B-L.	B-L.	Ti-6760.	WO.	36x6	40x11			
Mapleleaf.....1 1/2	3000		Hi-300.....3 3/4 x 5 1/2	Ful.	Ful.	Sh-1501.	WO.	34x5n	36x6n			
Mapleleaf.....AA2	3600		Hi-400.....4 1/2 x 5 1/2	Ful.	Ful.	Sh-103.	WO.	36x4	36x7			
Mapleleaf.....BB3	4050		Hi-500.....4 1/2 x 5 1/2	Ful.	Ful.	Sh-21.	WO.	36x4	36x7d			
Mapleleaf.....CC4	4800		Hi-200.....4 1/2 x 5 1/2	Ful.	Ful.	Sh-31.	WO.	36x5	36x5d			
Mapleleaf.....DD5	5625		Hi-1600.....4 1/2 x 5 1/2	Ful.	Ful.	Sh-51.	WO.	36x6	36x6d			
National.....FA1			Wa-BUX 3 3/4 x 5 1/2	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5			
National.....GA1 1/2			Wa-BUX 3 3/4 x 5 1/2	B-L.	B-L.	Ti-6460.	WO.	34x4k	35x5k			
National.....HD 2 1/2			Wa-CU.....4 3/4 x 5 1/2	H-S.	B-L.	Ti-6560.	WO.	36x4	36x8			
National.....NB 3 1/2			Wa-DU.....4 1/2 x 6 1/2	H-S.	B-L.	Ti-6666.	WO.	36x5	36x10			
National.....OA5			Wa-EU.....5 1/2 x 6 1/2	H-S.	B-L.	Ti-6760.	WO.	36x5	36x12			
Veteran.....M 1 1/2	2600		Bu-CTU 3 3/4 x 5 1/2	B&B.	Cot.	Sh-1501.	WO.	34x5n	35x5n			
Veteran.....P 2 1/2	3600		Bu-HTU 4 1/2 x 5 1/2	B&B.	Cot.	Sh.....	WO.	36x4	36x7			
Veteran.....R 3 1/2	4200		Bu-HTU 4 1/2 x 5 1/2	B&B.	Cot.	Sh-21.	WO.	36x4	36x7			
Veteran.....S 4	5395		Bu-YTU 4 1/2 x 6	B&B.	Cot.	Sh-31.	WO.	36x5	36x10			

## Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE				Belt Pulley, Dimensions Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS	
				Make	No. of Cyls. Bore & Stroke	Recom. Fuel				Dimensions, Diameter & Face (Ins.)	Type Final Drive
Allis-Chalmers.....6-12	1	1	\$295	LeR.	4-3 1/2 x 4 1/2	G.	10 x 5 1/2	2,500	48x 6	W	
Allis-Chalmers.....15-25	3	3	1185	Mid.	4-4 1/2 x 5 1/2	G.	12 1/2 x 6 1/2	4,700	48x12	W	
Allis-Chalmers.....20-35	4	4	1885	Own.	4-4 1/2 x 5 1/2	GK.	13 x 7 1/2	6,150	50x12	W	
Allwork.....D 20-38	4-5	4-5	1665	Own.	1-5 x 7	KD.	14 x 7 1/2	6,500	48x14	W	
Allwork.....G 14-28	3	3	1495	Own.	4-4 1/2 x 6	KD.	11 x 7	4,800	48x12	W	
Allwork.....C 16-30	3	3	1293	Own.	1-5 x 8	KD.	13 3/4 x 7 1/2	5,200	48x12	W	
Aultman-Taylor.....15-30	3-4	3-4	1900	Own.	1-5 x 8 1/2	GKD.	20 x 8	7,800	70x12	W	
Aultman-Taylor.....22-45	4-6	4-6	3100	Own.	1-5 1/2 x 8	GKD.	20 x 11	12,500	70x20	W	
Aultman-Taylor.....30-60	8-10	8-10	4400	Own.	1-7 x 9	GKD.	24 x 11	22,500	90x24	W	
Avery.....15-35	3-4	3-4	1000	Own.	1-4 1/2 x 6	GKD.	16 x 7 1/2	4,750	50x12	W	
Avery.....20-35	4-5	4-5	1500	Own.	1-4 1/2 x 7	GKD.	16 x 7 1/2	7,500	60x16	W	
Avery.....25-50	5-6	5-6	2000	Own.	1-6 1/2 x 7	GKD.	22 x 8 1/2	12,500	69x20	W	
Avery.....45-65	8-10	8-10	4000	Own.	1-7 1/2 x 8	GKD.	26 x 10	22,000	87 1/2 x 24	W	
Avery, Tr. Runner	3	3	1000	Own.	1-4 1/2 x 5 1/2	GKD.	12 x 6 1/2	5,000	48x 6	W	
Avery, Road Racer	3	3	1000	Own.	1-4 1/2 x 5 1/2	GKD.	12 x 6 1/2	5,000	48x 6	W	
Bates (St. Mule) H	15-25	3	1185	Mid.	4-4 1/2 x 5 1/2	G.	12 x 8 1/2	3,600	48x10	W	
Bates (St. Mule) F	18-25	3	1185	Mid.	4-4 1/2 x 5 1/2	G.	12 x 8 1/2	4,850	56x10	T	
Bates (St. Mule) G	25-35	4	1185	Mid.	4-4 1/2 x 6	GKD.	12 x 8 1/2	6,500	50x10	T	
Bates (St. Mule) 40	30-40	4	1185	Mid.	4-4 1/2 x 6	GKD.	12 x 8 1/2	8,500	54x10	T	
Best.....B 25-35	4	4	4,250	Ste.	4-4 1/2 x 6 1/2	GKD.	12 x 9	5,500	64x12	T	
Best.....30-40	4	4	4,250	Ste.	4-4 1/2 x 6 1/2	GKD.	12 x 9	5,500	64x12	T	
Best.....60-80	9	9	4,250	Ste.	4-4 1/2 x 6 1/2	GKD.	12 x 9	5,500	64x12	T	
Bryan.....Steam 15-30	3	3	2,500	Own.	2-4 x 5	KD.	18 x 7	5,500	52x12	W	
Case.....12-20	2-3	2-3	1,095	Own.	1-4 1/2 x 5	GKD.	14 1/4 x 6 1/2	4,230	42x12	W	
Case.....15-27	3-4	3-4	1,350	Own.	1-4 1/2 x 6	GKD.	16 x 6 1/2	6,900	52x14	W	
Case.....22-40	4-5	4-5	2,650	Own.	1-5 1/2 x 6 1/2	GKD.	16 1/2 x 8 1/2	10,700	56x16	W	
Case.....40-72	8-10	8-10	4,900	Own.	1-7 x 8	GKD.	19 1/2 x 10 1/2	21,200	72x20	W	
Caterpillar.....2 Ton 15-30	3	3	1,000	Own.	1-4 1/2 x 5 1/2	G.	11 1/2 x 6 1/2	4,000	48x 6	W	
Caterpillar.....5 Ton 25-40	4	4	1,000	Own.	4-4 1/2 x 6	G.	12 x 8 1/2	9,400	50x10	T	
Caterpillar.....10 Ton 40-60	6	6	1,000	Own.	4-6 1/2 x 7	G.	14 x 10 1/2	19,500	64x12	T	
Cletrac.....F 9-16	2	2	745	Own.	1-3 1/2 x 4 1/2	GK.	7 x 5	1,930	42x 5 1/2	T	
Cletrac.....W 12-20	2	2	1,345	Own.	1-4 1/2 x 5 1/2	GK.	8 x 6	3,455	48x 8	T	
Eagle.....F 12-22	3	3	1,000	Own.	2-7 x 8	G.	10 x 7	5,850	48x12	W	
Eagle.....H 16-30	4	4	1,000	Own.	2-8 x 8	G.	12 x 8	9,100	48x12	W	
E-B.....AA 12-20	3	3	1,000	Own.	1-4 1/2 x 5	GK.	12 x 6 1/2	4,550	54x12	W	
E-B.....Q 12-20	3	3	1,000	Own.	1-4 1/2 x 5	GK.	12 x 8	6,500	60x12	W	
E-B.....16-32	4	4	1,000	Own.	1-5 1/2 x 7	GK.	16 x 9	9,400	72x16	W	
Fageol.....19-12	2	2	1,175	Lye.	4-3 1/2 x 5	G.	10 x 6 1/2	3,600	48x 8 1/2	W	
Fordson.....A 18-22	2	2	1,000	Own.	1-4 1/2 x 5	GK.	13 x 7	5,800	60x10	W	
Frick.....C 15-28	3	3	1,600	Bea.	4-4 1/2 x 6	GK.	13 x 7	6,730	60x12	W	
Gray.....EU 22-40	4	4	1,000	Wau.	1-5 x 8 1/2	K.	10 x 8	6,900	54x14	Dr	
Hart-Parr.....20	2-3	2-3	845	Own.	2-5 1/2 x 6 1/2	K.	13 x 6 1/2	3,973	46x10	W	
Hart-Parr.....30	3-4	3-4	1,065	Own.	2-6 1/2 x 7	K.	14 x 8 1/2	5,220	52x10	W	
Hart-Parr.....(Road)	3-4	3-4	1,395	Own.	2-6 1/2 x 7	K.	14 x 8 1/2	7,560	52x18	W	
Heider.....D 9-16	2	2	1,000	Wau.	1-4 1/2 x 5 1/2	GK.	12 x 6	4,000	54x 8	W	
Heider.....C 12-20	3	3	1,000	Wau.	1-4 1/2 x 5 1/2	GK.	14 x 7	6,000	57x10	W	
Heider.....M 5-10	1	1	985	Wau.	1-3 1/2 x 4 1/2	GK.	8 x 5	2,800	46x 6	W	
Huber.....(Light 4)	12-25	3	985	Wau.	1-4 1/2 x 5 1/2	GK.	13 x 7	5,000	60x10	W	
Huber.....(Super 4)	15-30	3	985	Wau.	1-4 1/2 x 5 1/2	GK.	13 x 7	6,000	60x10	W	
LaCrosse.....M 6-12	1	1	1,000	Own.	2-4 x 6	G.	10 x 6	3,000	48x 7	W	
LaCrosse.....S 12-25	3	3	1,000	Own.	2-6 x 7	G.	12 x 8	3,800	56x10	W	
Lauson.....T 15-30	4	4	1,000	Mid.	4-4 1/2 x 5 1/2	G.	15x	4,208	50x12	W	
Leader.....N 12-18	2	2	1,000	Bea.	4-4 1/2 x 6	GKD.	14 x 7	4,800	50x12	W	
Leader.....N 16-32	3-4	3-4	1,000	Bea.	4-5 x 8	GK.	14 x 7 1/2	5,800	52x12	W	
Leader.....GU 16-32	3-4	3-4	1,000	Bea.	4-5 x 8	GK.	12 x 7	5,200	54x14	W	
Lincoln.....A 15-30	3	3	1,000	Own.	1-4 1/2 x 5	GK.	10 x 7	5,200	54x14	W	
Little Giant.....B 16-22	4	4	1,000	Own.	1-5 1/2 x 6	GK.	13 1/2 x 9	8,700	66x20	W	
Little Giant.....A 26-35	6	6	1,000	Own.	1-5 1/2 x 7	GK.	13 1/2 x 9	19,000	x12	W	
Lombard.....100	12-16	12-16	1,000	Mid.	4-4 1/2 x 5 1/2	G.	13 x 7	6,000	60x10	W	
London.....12-25	3	3	1,000	Mid.	4-4 1/2 x 5 1/2	G.	13 x 7	6,000	60x10	W	

## GARDEN TRACTORS

Aro.....F	3-6	1	385	Own.	1-4 1/2 x 5	G.....	6 x 4 1/2	1,000	30x 4	W
Beeman.....Jr.	1 1/2-1	1	180	B&S.	1-2 1/2 x 2 1/2	G.....	3 1/4 x 2	190	16x 3	W
Beeman.....K	1 1/2-1	1	265	Own.	1-3 1/2 x 4 1/2	G.....	3 1/2 x 4 1/2	550	25x 3 1/2	W
Bolens.....	1	1	180	B&S.	1-2 1/2 x 2 1/2	G.....	3 x 2	190	10x 3	W
Centaur.....(1923)	2 1/2-5	1	345	N-W.	1-4 1/2 x 4 1/2	GK.....	4 x 6	700	28x 4	W
De-It-All.....(Jack)	2 1/2-6	1	395	Own.	1-3 1/2 x 3 1/2	G.....	3 x 3	750		W
De-It-All.....(Baby)	2 1/2-6	1	495	Own.	1-4 1/2 x 5	G.....	2 x 2	1,200	26x 2 1/2	W
De-It-All(Twin12)	4-15	1	495	Own.	1-4 3/4 x 3 7/8	GK.....	4 x 4	800	32x 4	W
Kinkadee.....	1 1/2-3	1	190	Own.	1-3 x 3	G.....	None.....	180	22x 5 1/4	W
M.B.M. Red.....E	1-4 1/2	1	250	Own.	1-3 3/4 x 4	G.....	3 x 3 1/2	410	20x 3	W
Motor Maculicator.....			148	Own.	1-2 3/4 x 3 1/2	G.....	None.....	210	19x 3 1/2	W
N.B.....	2	6	375	Own.	2-2 1/4 x 4	G.....	5 1/2 x 4 1/2	750	32x 4	W
Utilitor.....501	2 1/2-4	1	295	Own.	1-3 1/2 x 4 1/2	G.....	4 5/8 x 3 3/4	750	24x 4	W
Utilitor.....501A	2 1/2-4	1	340	Own.	1-3 1/2 x 4 1/2	G.....	4 5/8 x 3 3/4	925	24x 4	W

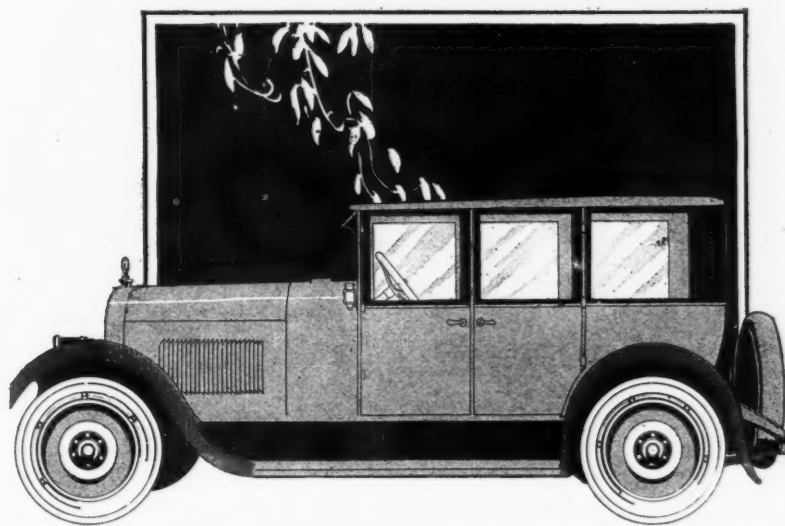
# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)†	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS			Make				No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Type and Make				Type and Make	Type and Make
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485		127	33x4½	American.....D-66	H-S.	6-3½x5	29.40	Strom.	G-D.	A-K.	s-p B&B.	B & B.	m Hartford.	F Salis.	4.50
	1650						127	33x4	American.....Steamer	Own.	2-	None	None	L-N.	L-N.	None	None	f Universal.	½ F Own.	1.75
	1195				(1450d 1595d)		114	32x4	Anderson.....41	Cont.	6-3½x4½	23.44	Zenith.	West.	West.	s-p B&B.	Durston.	f Universal.	½ F Salis.	4.75
1495	1495	1595	(1785b 1915c)	\$1995c	1995d		122	32x4	Anderson.....Series 50	Cont.	6-3¾x4½	27.34	Rayfield.	Remy.	Remy.	s-p B&B.	Durston.	f Universal.	¾ F Salis.	4.62
	1535						132	33x4	Anderson.....Series 50	Cont.	6-3¾x4½	27.34	Rayfield.	Remy.	Remy.	s-p B&B.	Durston.	f Universal.	¾ F Salis.	4.62
	2800	2900		3625	3750	\$3850	120	32x4	Apperson.....6	Falls.	6-3½x4½	23.44	Strom.	Remy.	Remy.	s-p B&B.	Own.	m Thieme.	½ F Own.	1.60
	1275	1345	1995m	1965†	2245		130	33x5	Apperson.....8-23-S	Own.	8-3½x5	33.80	Johnson.	Bijur.	Remy.	m-d Own.	Own.	m Thieme.	½ F Own.	1.75
	1095				1465		121	32x4	Auburn.....6-51	Cont.	6-3¾x4½	27.34	Strom.	Remy.	Remy.	s-p B&B.	G-L.	m Universal.	¾ F Salis.	1.75
							114	31x4	Auburn.....6-43	Cont.	6-3¾x4½	23.44	Strom.	Remy.	Remy.	s-p B&B.	Warner.	m Detroit.	½ F Col.	1.60
							122	32x4½	Auburn.....6-63	Weid.	6-3½x5	25.35	Strom.	Remy.	Remy.	s-p B&B.	Warner.	m Thieme.	½ F Col.	1.60
	1395		1495d		(1850 2250p)		118	32x4	Barley.....	Cont.	6-3¾x4½	23.44	Strom.	Deleo.	Deleo.	s-p B&B.	Fuller.	f M&E.	½ F Col.	1.58
805	885	725g		1175	1395		109	31x4	Buick.....1923-34-5-6-7-38	Own.	4-3¾x4½	18.23	Marvel.	Deleo.	Deleo.	m-d Own.	Own.	m Own.	¾ F Own.	1.60
					1325															
1175	1195	975g		1935	1985		118	32x4	Buick.....1923-41-4-5-47	Own.	6-3¾x4½	27.31	Marvel.	Deleo.	Deleo.	m-d Own.	Own.	m Own.	F Own.	1.10
	1435	(1625a 1675c)		1895	2195		124	33x4½	Buick.....1923 48-9-50-4-55	Own.	6-3¾x4½	27.31	Marvel.	Deleo.	Deleo.	m-d Own.	Own.	m Own.	F Own.	1.10
2885	2885	2885		3675c	(3950 4300f)		132	33x5	Cadillac.....61	Own.	8-3½x5½	31.25	Own.	Deleo.	Deleo.	m-d Own.	Own.	m Spicer.	F Tim.	Opt.
				3750	3990															
1760	1790		2230d	2480	2575		122	32x4½	Case.....X	Cont.	6-3¾x4½	27.34	Rayfield.	Deleo.	Deleo.	m-d Own.	Own.	f Sned.	½ F Col.	1.66
			1990	1950c	2480	2975	129	34x4½	Case.....W	Cont.	6-3¾x5½	31.54	Rayfield.	Deleo.	Deleo.	m-d Own.	Own.	f Arvac.	½ F Col.	1.45
1185	1185		1445c	1595	1585		117	32x4	Chalmers.....1923	Own.	6-3¾x4½	25.35	Strom.	A-L.	Remy.	m-d Own.	Own.	m Hardy.	½ F Adams.	5.17
		1345				2095	122	32x4	Chalmers.....1923	Own.	6-3¾x4½	25.35	Strom.	A-L.	Remy.	m-d Own.	Own.	m Hardy.	½ F Adams.	5.13
	1395	1545	1695c		1695		123	32x4	Chandler.....Six	Own.	6-3½x5	29.40	Strom.	Bosch.	Bosch.	s-p B&B.	Own.	f Own.	F Own.	1.45
	1595				2195															
510	525	425g		680	860		103	30x3½	Chevrolet.....Superior	Own.	4-3½x4	21.76	Zenith. Holley.	Remy. A-L.	Remy.	e Own.	Own.	m Own.	½ F Own.	3.77
					850															
710	725	625g		880	1060		103	30x3½	Chevrolet.....M	Own.	4-3½x3½	19.60	Carter.	Remy.	Remy.	m-d Own.	Own.	m Mech.	½ F Own.	1.44
					1050															
1085	995		(1095d 1260d)	(1295d 1495d)	(1395p 1595p)		112½	31x4	Cleveland.....42	Own.	6-3½x4½	22.50	Strom.	Bosch.	Bosch.	s-p B&B.	Own.	m Mech.	½ F Own.	1.90
1885		1885	1885c	2585	2685	2685	127½	33x5	Cole.....890	Nort.	8-3½x4½	39.20	Johnson.	Delco.	Delco.	m-d North.	Own.	m Spicer.	¾ F Col.	1.70
	1475			1925c	1995		115	32x4	Columbia.....Big Six	Cont.	6-3¾x4½	27.34	Strom.	A-L.	A-K.	s-p B&B.	Durston.	m Spicer.	½ F Tim.	4.75
985c	1135		1395d	1295	1465		115	31x4	Columbia.....Light Six	Cont.	6-3¾x4½	23.44	Strom.	A-L.	A-L.	s-p B&B.	Durston.	m Spicer.	½ F Tim.	5.10
	1095				1685															
1195	1235		(1495b 1565c)	1875†	2055		116	32x4	Courier.....	Falls.	6-3½x4½	23.44	Strom.	West.	A-K.	s-p B&B.	Muncie.	f Flexite	¾ F Col.	5.00
				2055																
		3000			4500		138	33x4½	Crawford.....23-6-60	Cont.	6-3¾x5½	31.54	Zenith.	West.	Bosch.	m-d B-L.	B-L.	m Spicer.	½ F Tim.	
			3500c	4250			138	33x5	Crawford-Dagmar.....6-70	Cont.	6-3¾x5½	31.54	Zenith.	West.	Bosch.	m-d B-L.	B-L.	m Spicer.	½ F Tim.	
							142	33x5	Cunningham.....V4	Own.	8-3½x5½	45.00	Strom.	Delco.	Delco.	m-d Own.	Own.	f Sned.	F Tim.	1.23
4350	4350c	4350	4350c	5300	(5350 6030f)		132	33x5	Daniels.....23-38	Own.	8-3½x5½	39.20	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	F Tim.	1.23
					(6250 6900f)															
1495	1295		1495c	1535	1795	1795c	115	31x4	Davis.....71	Cont.	6-3½x4½	23.44	Strom.	Deleo.	Deleo.	s-p B&B.	Warner.	m Peters.	½ F Tim.	5.10
1595	1595		1695d	2095	1795c		120	32x4½	Davis.....63-65	Cont.	6-3¾x4½	27.34	Strom.	Deleo.	Deleo.	s-p B&B.	Warner.	m Peters.	½ F Tim.	5.15
850	880			980	1140		114	32x4	Dodge Brothers.....	Own.	4-3½x4½	24.03	Stewart.	N.E.	N.E.	m-d Own.	Own.	m Own.	½ F Own.	1.18
		3950	4150c	4985c	6800		4310	32x5	Dorris.....6-80	Own.	6-4 x5	38.40	Strom.	West.	Bosch.	m-d Own.	Warner.	m Spicer.	½ F Tim.	1.23
870	885		(980a 995c)	1240	1350		108	31x4	Dort.....23-18	Lye.	4-3½x5	19.60	Carter.	Bosch.	Conn.	m-d Detlaff.	Own.	m Mech.	¾ F Flint.	1.66
				1020	1070															
1010	1025			1145	1195		115	31x4	Dort.....25-20	Falls.	6-3¾x4½	23.44	Carter.	Bosch.	Bosch.	m-d Detlaff.	Own.	m Mech.	¾ F Flint.	1.66
				1355	1465															
5750	5500	5900	5750c	7250	7500		134	33x5	Duesenberg.....Straight 8	Own.	8-2½x5	26.45	Strom.	Deleo.	Deleo.	s-p Own.	Own.	f Climax.	½ F Own.	1.45
890	890		1065d	1365	1465		109	31x4	Durant.....A-22	Cont.	4-3¾x4½	24.03	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	½ F Adams.	1.33
1600	1650		2250	2100	223½		123½	32x4½	Durant.....B-22	Anst.	4-3½x4½	25.35	Rayfield.	A-L.	A-L.	s-p Ansted.	Warner.	m Spicer.	½ F Tim.	5.15
1485	1095		1395c	1595	112		112	32x4	Earl.....40	Own.	4-3½x5½	18.91	Scoc.	A-L.	Conn.	s-p B&B.	Own.	f Own.	½ F Own.	1.87
	965		1095	1425	112		112	31x4	Elcar.....4-40	Lye.	4-3½x5	21.03	Strom.	Deleo.	Deleo.	s-p B&B.	Warner.	m Peters.	½ F Salis.	1.50
1395	1395		1595d	1975	1995		118	32x4	Elcar.....6-60	Cont.	6-3¾x4½	27.34	Strom.	Deleo.	Deleo.	m-d Warner.	Warner.	m Spicer.	½ F Salis.	1.50
	1045			1145	1145		108½	32x4	Essex.....	Own.	4-3¾x5	18.23	Own.	Bosch.	Bosch.	m-d Own.	Own.	m Spicer.	½ F Own.	1.66
	1195		1195	1895c	1985		120	32x4½	Flint.....	Cont.	6-3¾x5	27.34	Strom.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	¾ F Adams.	1.66
269†	298a	235g		530	595		100	30x3½	Ford.....	T	4-3½x4	22.50	Own.	Holley.	Own.	m-d Own.	Own.	m Own.	½ F Own.	3.63
				725																
3900	3900			4900	4900		132	32x4½	Fox.....7F	Own.	6-3¾x5	27.34	Zen th.	West.	Scintilla	m-d B-L.	B-L.	m Spicer.	½ F Tim.	1.90
	1950		(2750c 2850f)	2250	\$3150d		115	32x4	Franklin.....10	Own.	6-3½x4	25.35	Own.	A-K.	A-K.	s-p B&B.	Own.	m Spicer.	½ F Own.	1.73
995	995		1145c	1445	1445		112	32x4	Gardner.....Series 5	Lye.	4-3½x5	21.76	Zenith.	West.	West.	s-p B&B.	Mech.	m Peters.	¾ F Flint.	1.80
490	520			715	785		100	30x3½	Gray.....	Own.	4-3¾x4	21.03	Scoc.	West.	West.	s-p Own.	Own.	m Mech.	½ F Tim.	3.90
				835																
2250	2250		2850†	2600			120	32x4½	H.C.S.....Series 4	Weid.	4-3¾x5½	22.50	Strom.	Deleo.	Deleo.	m-d B-L.	B-L.	m Spicer.	¾ F Own.	1.63
1																				



*The Coachbuilt*  
**ANDERSON**  
 ALUMINUM SIX



**SPECIFICATIONS**  
 (Sedan Model)

Coachbuilt Anderson  
 Aluminum Body  
 6 Cylinder Red Seal  
 Continental Motor  
 Westinghouse Starting,  
 Lighting and Igni-  
 tion  
 Borg & Beck Clutch  
 Cord Tires  
 Alemite Lubrication  
 Snubbers  
 Motometer  
 Wind Shield Cleaner  
 Wind Shield Shade  
 Foot Dimmer for  
 Headlights  
 Cowl Ventilator  
 Heater  
 Foot Rest  
 Vanity Set  
 Dome Light  
 Reading Lamp  
 Averages 19 miles per  
 gallon of gas  
 Wheelbase, 115 inches  
 Color—Maroon body  
 with black mud  
 guards.

**Sedan**  
*only*  
**\$1595**

*Touring Car \$1195*

*Coach \$1450*

*f. o. b. factory*

*Contract with prosperity. Ask about the  
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Anderson Motor Co., Rock Hill, S. C.

# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		
OPEN MODELS			CLOSED MODELS			Make				No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Type and Make				Type and Make	Type and Make	Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.																
\$2385	\$1885	\$2385	\$2385c	3375	3075	124	32x4 1/2	Kissel.....45	Own.	6-3 1/2x5 1/2	26.38	Strom.	Remy.	Remy.	m-d Warner	Warner.	m Spicer.	F Own.	3.92		
3985	4090	4090	2145d	2975	5500	132	33x5	LaFayette.....23	Own.	8-3 1/2x5 1/2	33.80	Johnson.	Delco.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.58		
1795	1795	1795	2345	2345	2645	123	32x4 1/2	Lexington.....	Anst.	6-3 1/2x4 1/2	25.35	Rayfield.	G-D.	Conn.	m-d Own.	Warner.	f Snead.	F Salis.	5.10		
1575	1395	1575	2085	2245	1695	117	32x4	Liberty.....10-D	Own.	6-3 1/2x5	23.44	Strom.	Wagner	Wagner	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.80		
3800	3800c	3800	4600c	4400	4900	136	33x5	Lincoln.....	Own.	8-3 1/2x5	36.45	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	F Tim.	4.58		
8600	9500c	9600	11750	11750	11600	142	35x5	Locomobile.....Series 8	Own.	6-4 1/2x5 1/2	48.60	Ball&B.	West.	Delco.	m-d Own.	Own.	m Own.	F Own.	3.85		
3385	3185	3185	4685	4685	4385	136	32x4 1/2	Marmen.....34	Own.	6-3 1/2x5 1/2	33.75	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	3/4 F Own.	4.10		
885	885	885	975b	985	1235	109	31x4	Maxwell.....	Own.	4-3 1/2x4 1/2	21.03	Stewart.	Remy.	Remy.	c Own.	Own.	f Own.	1/2 F Own.	4.60		
5400	4550g	5700	5600c	6720	6600c	140	33x5	McFarlan.....1923	Own.	6-4 1/2x6	48.60	Rayfield.	West.	West.	m-d M&E.	B-L.	m Peters.	F Tim.	3.75		
3950b	3750c	3950c	3950c	4700	4850	132	32x4 1/2	Mercer.....Series 5	Own.	4-3 1/2x6 1/2	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer.	F Own.	3.87		
1695	1695	1695	1850c	2050c	2275	119	32x4	Mercer.....6	Own.	6-3 1/2x5	33.75	Strom.	West.	Eisem.	m-d Own.	Own.	m Spicer.	3/4 F Own.	3.77		
1590	1590	1590	1850c	2050c	2275	120	32x4	Merit.....	Cont.	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Muncie.	f Snead.	F Col.	4.60		
1295	1690	1495d	1585c	1605	1895p	127	32x4 1/2	Mitchell.....F-50	Own.	6-3 1/2x5	29.40	Strom.	Remy.	Remy.	s-p B&B.	Own.	m Own.	F Own.	4.42		
1785	1995c	1785	1995c	2090	2190	127	34x4 1/2	Mitchell.....F-50	Own.	6-3 1/2x5	29.40	Strom.	Remy.	Remy.	s-p B&B.	Own.	m Own.	F Own.	4.42		
1240	1240	1645c	1785	1885	2090	121	32x4	Moon.....6-58	Cont.	6-3 1/2x4 1/2	23.41	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Spicer.	1/2 F Tim.	5.10		
915	935	1195d	1445	1445	1895	112	33x4	Nash.....691-3-6-7	Own.	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
2475	2475c	2375	2485d	3250	3285	130	32x4 1/2	Nash.....692-4-5	Own.	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
1485	795	2600c	1165c	1185	1545	115	32x4	Nash.....41-8	Own.	4-3 1/2x5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.88		
2500	2500c	2600c	1165c	1185	1545	115	32x4	National.....BB	Own.	6-3 1/2x5 1/2	29.40	Rayfield.	West.	Delco.	s-p B&B.	B-L.	m Universal.	F Col.	4.08		
975	995	795g	1145a	1445	1445	115	32x4	National.....6-51	Cont.	6-3 1/2x4 1/2	27.34	Strom.	A-L.	Own.	s-p B&B.	Covert.	m Universal.	3/4 F Salis.	4.50		
975	975	1075c	1145a	1445	1445	115	32x4	National.....6-31	Own.	6-3 1/2x4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.60		
1825p	1375	1735	1675c	1875	2025	122	33x4 1/2	Noma.....4C	Own.	6-3 1/2x4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Muncie.	m Mech.	F Own.	4.66		
525	525	425c	795	860	100	30x3 1/2	32x4 1/2	Oakland.....6-44	Own.	6-2 1/2x4 1/2	18.99	Marvel.	Remy.	Remy.	c Own.	Muncie.	m Mech.	F Own.	4.70		
2485	2485	2250g	2650c	3175c	3325	126	33x4 1/2	Oldsmobile.....43 A	Own.	4-3 1/2x5 1/2	21.86	Zenith.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	3/4 F Own.	4.70		
2350c	2685	2350c	2685	3525	3575	133	33x4 1/2	Oldsmobile.....46	Own.	8-2 1/2x4 1/2	26.45	Ball&B.	Delco.	Delco.	c Own.	Muncie.	m Spicer.	F Own.	1.93		
3850	3850	3850	5240	5100	5400	136	35x5	Oldsmobile.....47	Own.	8-2 1/2x4 1/2	26.45	Johnson.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	3/4 F Own.	5.10		
2695	2450	2450	3235	3235	3350d	120	30x3 1/2	Overland.....91	Own.	4-3 1/2x4	18.23	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50		
1550	1390	1425	1465d	2395d	3325	133	33x4 1/2	Packard.....126	Own.	6-3 1/2x5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.66		
3300	2990	2990	3300	3400	4090	128	33x5	Packard.....133	Own.	6-3 1/2x5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.66		
5250	5250	5250	6800	6900	6800	138	33x5	Packard.....335	Own.	12-3x 5	43.20	Own.	Bijur.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.36		
575	595	1745	2445	2495	3575	126	32x4 1/2	Paige.....6-70	Cont.	6-3 1/2x5	33.75	Rayfield.	Remy.	A-K.	m-d Long.	Warner.	m Mech.	1/2 F Tim.	4.45		
3150	3100	3250	3300c	4300	5090	126 1/2	32x4 1/2	Pateron.....23-6-52	Cont.	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Durston.	m Hartford.	1/2 F Salis.	4.50		
1095	1095	2485	2585d	3350	3550	128	32x4 1/2	Peerless.....23	Own.	8-3 1/2x5	33.80	Ball&B.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Tim.	4.90		
2485	2485	2585d	3350	3550	3675	128	32x4 1/2	Pierce-Arrow.....	Own.	6-4 x5 1/2	38.40	Own.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.29		
1665	2850	2850c	2385c	2475	3550	132	32x4 1/2	Pilot.....6-50	H.S.	6-3 1/2x5	25.35	Till.	Bijur.	Conn.	s-p Hoosier.	Muncie.	m Hartford.	3/4 F Col.	4.33		
2850	2900	2850c	3500	3700	4000	124	32x4 1/2	Premier.....Strattan	Own.	4-3 1/2x4 1/2	14.40	Zenith.	A-L.	A-L.	m-d Covert.	Covert.	m Spicer.	1/2 F Tim.	4.38		
1645	1185	1745	1855c	1885	2436d	120	32x4	Premier.....6-D	Own.	6-3 1/2x4 1/2	27.34	Johnson.	Delco.	Delco.	s-p B&B.	Own.	m Spicer.	1/2 F Tim.	4.38		
2685	2485	2685	2750c	3585	3585d	117	32x4	Premocor.....6-40-A	Falls.	6-3 1/2x4 1/2	23.44	Strom.	Wagner	Wagner	s-p B&B.	Mech.	m Spicer.	1/2 F Own.	5.09		
3685	3485	3800	3650c	4650p	4650p	128	32x4 1/2	Princeton.....	Anst.	6-3 1/2x4 1/2	27.34	Rayfield.	A-L.	A-L.	m-d Own.	Own.	m Spicer.	1/2 F Own.	5.12		
10900	10900	10950	12800	12800	143 1/2	33x5	32x4	Princeton.....	Anst.	6-3 1/2x4 1/2	27.34	Rayfield.	A-L.	A-L.	m-d Own.	Own.	m Spicer.	1/2 F Own.	5.12		
1645	1645	2645d	2645	3585	3985	130	32x4 1/2	R & V Knight.....R	Own.	4-3 1/2x5	22.50	Strom.	Wag.	Wag.	s-p B&B.	B-L.	m Spicer.	F Salis.	1.75		
875	875	2500	2500c	3300	3400	127	34x4 1/2	R & V Knight.....H	Own.	6-3 1/2x4 1/2	20.40	Strom.	A-L.	A-L.	s-p B-L.	B-L.	m Spicer.	1/2 F Tim.	5.40		
985	985	2500	2500c	3300	3400	127	34x4 1/2	Reo.....76	Own.	6-3 1/2x5	24.34	Rayfield.	N.E.	N.E.	m-d Own.	Own.	m f Own.	1/2 F Own.	4.70		
2750	2750	2750	2425g	3585	3985	130	32x4 1/2	Rickenbacker.....B	Own.	6-3 1/2x4 1/2	23.44	Strom.	Bosch.	Bosch.	s-p Own.	Warner.	m Mechanics.	3/4 F Col.	4.68		
319r	348c	285c	580c	645	102	30x3 1/2	32x4 1/2	Roamer.....6-54-E	Cont.	6-3 1/2x5 1/2	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Snead.	1/2 F Tim.	4.60		
2250	2250	2450	2275c	3150	3450	125	34x4 1/2	Roamer.....4-75-E	Roach.	4-4 1/2x6	28.90	Strom.	West.	Split.	m-d B-L.	B-L.	f Snead.	1/2 F Tim.	4.68		
2700	2700	2850	2700c	3500	4500	130	34x4 1/2	Rolls-Royce.....40-50	Own.	6-4 1/2x4 1/2	48.60	Own.	Bijur.	Bosch.	c Own.	Own.	m Own.	F Own.	3.25		
1345	1295	1985c	1505d	1895	2385	124	33x4 1/2	Rubay.....	Own.	4-2 1/2x5 1/2	12.10	Strom.	Bosch.	Bosch.	s-p Own.	Own.	m Universal.	F Own.	5.10		
975	975	785c	1225	1550	112	31x4	32x4	Sayers Six.....DP	Cont.	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	(J-T)	m Arva.	1/2 F Eaton.	4.75		
1450g	1835	1750	2100c	2550	2750	126	33x4 1/2	Seneca.....L-2 & O-2	Lyc.	4-3 1/2x5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal.	F Peru.	4.50		
1995	1995	2640	2765a	3490	3490	130	32x4 1/2	Seneca.....50 & 51	Lyc.	4-3 1/2x5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal.	F Peru.	4.50		
2450	2790	2640	2765a	3490	3490	130	32x4 1/2	Standard.....99	Own.	8-3 1/2x5	33.80	Zenith.	West.	Split.	s-p B&B.	G-L.	m Arva.	1/2 F Tim.	4.45		
1275	1275	1305	1795	1795d	115	32x4	32x4	Stanley.....740	Own.	2-4 x5	None.	Bijur.	None.	None.	None.	None.	None.	1/2 F Own.	1.50		
1690	1990	2190f	2490	2490	120	32x4 1/2	32x4 1/2	Star.....	Cont.	4-3 1/2x4 1/2	15.63	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	3/4 F Tim.	4.87		
2575	2475	3375																			





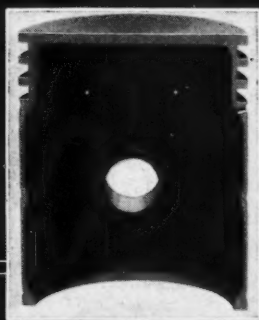
## No Longitudinal Ribs

You will find no longitudinal ribs in Spencer-Smith Pistons because the extra metal required for the ribs results in greater expansion and causes the ribs to wear away the cylinder walls at these points.

Spencer-Smith Pistons are light—yet require no longitudinal reinforcement. The best engineering practice demands radial ribs.

SPENCER-SMITH MACHINE COMPANY  
HOWELL, MICHIGAN

Largest Manufacturers of Pistons Exclusively



# SPENCER-SMITH PISTONS

# SPECIAL OFFER

Money-back Guarantee

*Handy Ben*  
TRADE MARK  
**VISIBLE**

## The Always-Busy OIL SALESMAN

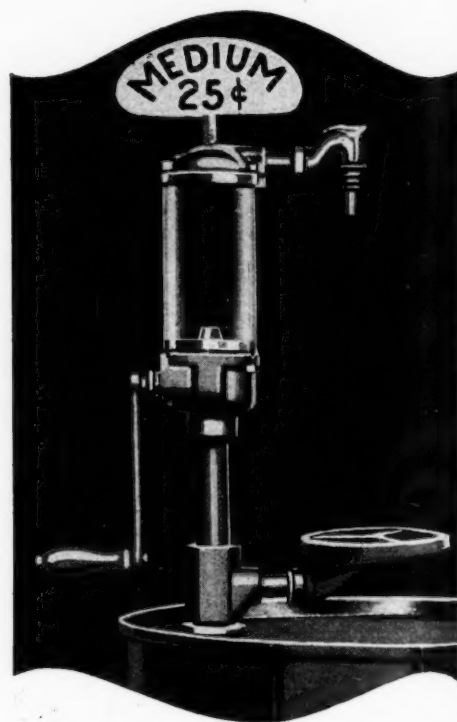
Make a real business of selling oil and alcohol. You can build up a surprisingly large volume of selling with up-to-date equipment.

Other dealers are doing it. If we stated figures you wouldn't believe them. The best way is to experiment, and prove to yourself that we make no overstatement. You can do so without a cent of loss—on the contrary, with much extra profit.

**HANDY BEN** fits any oil drum. Just set him in and tighten the nuts. No extra equipment to buy. He makes any oil drum a quick-acting silent salesman. Well-made; he'll last your business lifetime. Try him out for thirty days, and see how much of his cost he has repaid in extra sales.

Clip the coupon now, and start him working for you immediately.

**Bennett Injector Co.**  
Muskegon Mich.



**ONLY  
\$12.75**

If you take advantage  
of this special offer



### Special Trial Offer Coupon

**S**IMPLY fill in the name of your oil or accessory jobber on this blank, and enclose your check or money order for \$12.75. Prompt shipment will be made. Your money refunded if you are dissatisfied for any reason in 30 days.

Ship to.....  
Address.....  
City.....  
State.....

Jobber's Name

Address

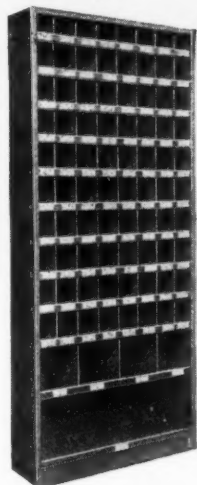


# Better service for your car owners

All parts always  
in stock

Can be located  
immediately

Complete stocks and  
quick service  
bring business



Unit F-13

1 Bin 36x12  
4 Bins 9x9  
80 Bins 4 1/2 x 6



Hite D. Bowman Company Garage, Louisville, Ky.

**Y**OU make money by making friends.

The surest way to the heart of a car owner is to give him prompt action, and a reputation for taking care of emergencies immediately is your greatest asset.

With Berloy Steel Bins you can give quicker service and at a lower cost. A place of the right size and shape is provided for all parts. You save at least 25% floor space.

Our boltless divider, an exclusive feature, gives 1 1/2" adjustment without

bothering with bolts and nuts. Your parts and accessories are kept in good condition, well arranged, properly indexed and attractively displayed. Any employee can locate quickly what the customer wants.

This better service means more sales, quicker turnover and increased profit. We furnish complete systems or standard units for any make of car parts and can give you exactly what you need. Our catalog No. 30 will be very helpful to you. Write our nearest branch.



**BERLOY**

**THE BERGER MANUFACTURING CO., CANTON, OHIO**

NEW YORK  
BOSTON  
DALLAS

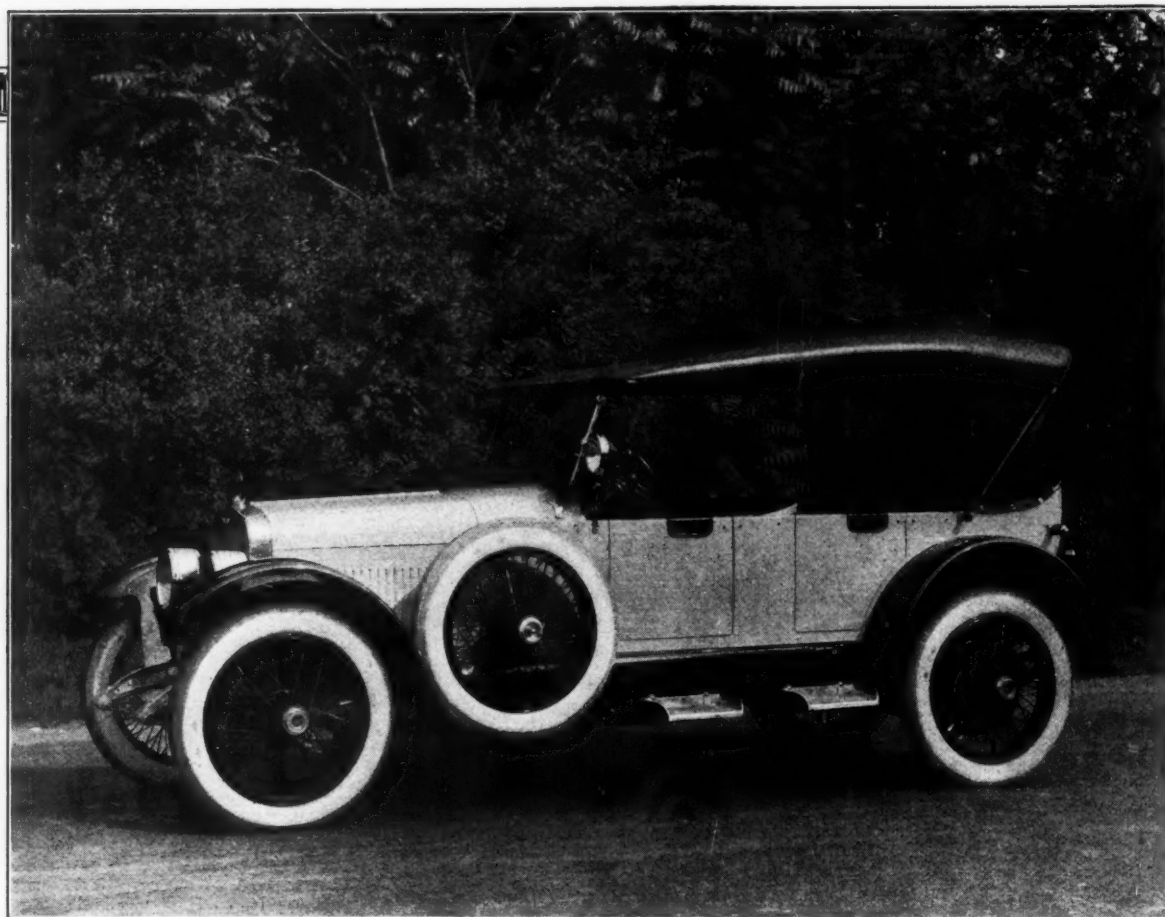
ROANOKE  
CHICAGO  
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PHILADELPHIA  
JACKSONVILLE  
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SAN FRANCISCO

EXPORT DEPT.:  
514-524 W. 25th. St.  
NEW YORK, N. Y.

## Berloy steel bins for parts



Series IV Four Touring

# The Impression

The impression of excellence and desirability created by your prospect's first inspection of an H.C.S. never wears out. The H. C. S. appeals to his eye and to that sixth sense which gets and keeps a conviction of uncommon character.

That impression persists during the sale—and thereafter. Last year the repair parts required for all the H. C. S. cars ever built amounted in list price to less than 1% of the wholesale price of H. C. S. cars sold during the year.

# H. C. S.

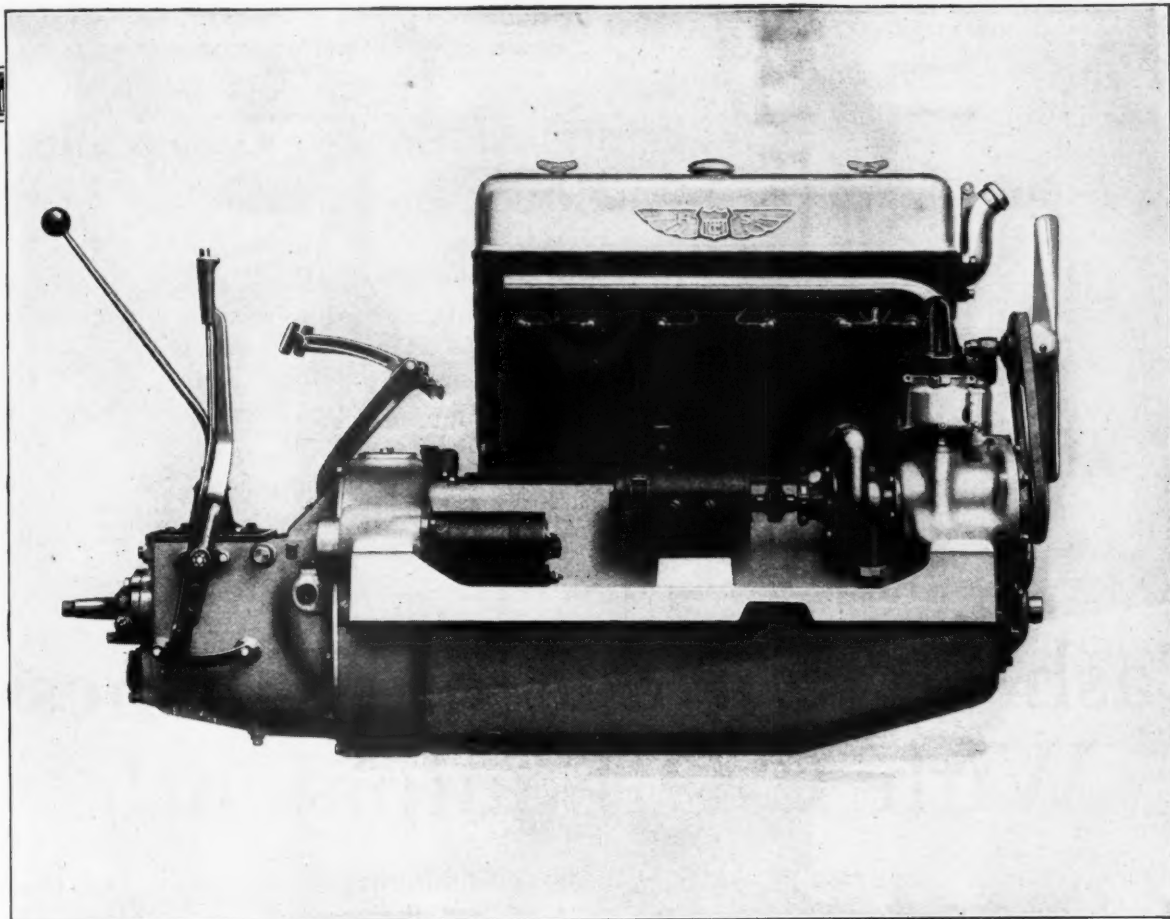
DESIGNED AND BUILT BY HARRY C. STUTZ  
H. C. S. Motor Car Co., Indianapolis

SERIES IV

SIX TOURING, \$2650

FOUR TOURING, \$2250





The New H. C. S. Six Motor

# H. C. S. Creates

The new H. C. S. Six and the new H. C. S. Four are the best cars Harry C. Stutz ever built. This is a powerful recommendation of worth to the people who buy fine motor cars. There is a well-founded public impression that Harry C. Stutz is the foremost American fine car designer.

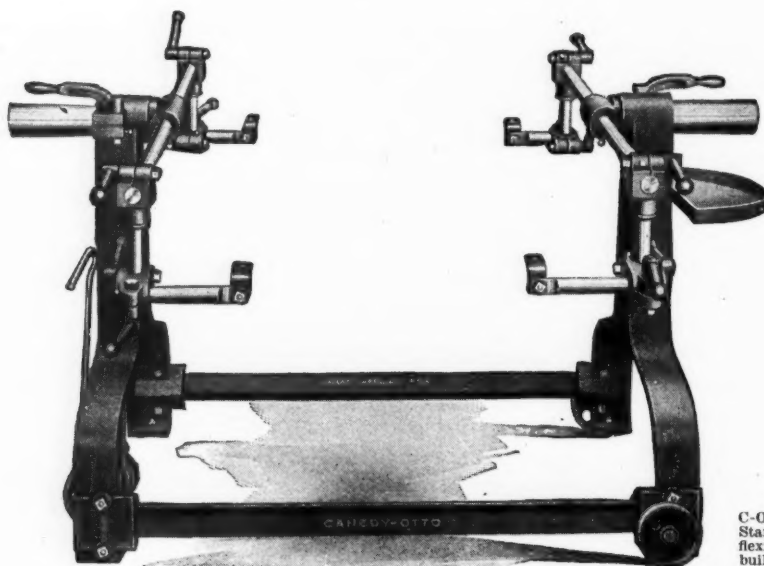
The H. C. S. dealer proposal will impress you with its profit probability. Liberal discounts, ample territory, and a moderate investment characterize it.

# H. C. S.

DESIGNED AND BUILT BY HARRY C. STUTZ

H. C. S. Motor Car Co., Indianapolis

FOUR ROADSTER, \$2250 • FOUR BROUGHAM, \$2850 • FOUR COUPE, \$2600



C-O Universal Motor Stand. The most flexible stand ever built.

## Cash In On Spring Business With C-O Equipment!

Any make, any type, any size of engine is most quickly and easily overhauled with the aid of C-O Universal Motor Stands, Burning-In Machines and other time-saving, labor-saving C-O shop equipment.

No other equipment has so many advanced and exclusive facilities for the production of quick and perfect work, nor is so completely adaptable to varying service requirements.

In handling a rush of business, C-O equipment is invaluable. Turning out most work in the shortest possible time, it greatly increases daily receipts and profits. Quality of work is safeguarded as well, eliminating complaints, and adding to your reputation.

Behind C-O equipment stand fifty years of

leadership in the manufacture of high grade shop tools and machinery. Produced complete within the one organization, under the most advanced shop methods, it combines maximum quality and value.

Prepare now to cash in on the heavy business of spring and summer by installing C-O equipment. Consult your jobber, and write for our big catalog, showing a complete line of tools and machinery for every shop purpose.

*Address Dept. A*

### CANEDY-OTTO MFG. CO.

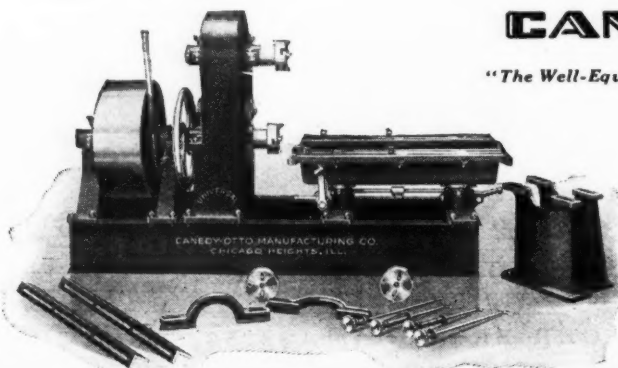
*Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tynere Irons and Blast Gates*

Main Office and Factory—Chicago Heights, Ill.

New York Branch—407 Broome St.

San Francisco Branch—952 Folsom St.

**CANEDY-OTTO**  
"The Well-Equipped Shop Gets The Business"



C-O Universal Burning-In Machine. Fits 95 per cent perfect bearings in any type or size of engine in from 45 minutes to an hour. An indispensable aid to modern service.



The user of steel is constantly watchful of two disturbing terrors:

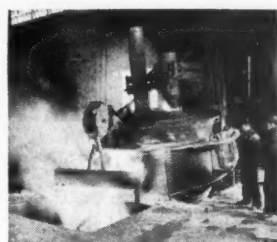
Will the quality be uniformly high?

Will the delivery be certain?

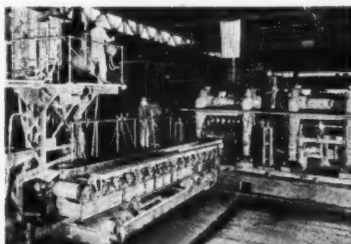
The astute buyer of steel knows that any steel company, making a number of different grades of steel for different uses, will have its hands full in making his particular order to his particular specifications. You can not, to get a certain special heat in a steel mill, simply change a couple of jigs or reset several gauges.

He knows, further, that he is utterly dependent on the steel maker's judgment and responsibility; that if, in times of pressing need, the steel delivered is not "quite up to snuff" he dare not afford the delay of refusing its acceptance and waiting for a new shipment.

Anti-friction bearings must be built of steel made to difficult specifications. For hardening purposes it must be clean (electric furnace) steel. It must be uniform. And anti-friction bearings being supplied to the Automotive Industry must be made of steel whose supply is constant.



One of the Electric Furnaces



Part of the Timken Rolling Mill



In the Timken Tube Mill

Thus it was that The Timken Roller Bearing Company, five years ago, with some foresight, erected its own electric furnace steel mill, its own rolling, seamless tube, rod and wire mills.

Out of our wealth of experience in building 80,000,000 Timken Bearings we have determined the analyses and fabrications making the most suitable automotive bearings.

Timken specifications (they are no secret and are given herewith) are the specifications for every one of our 8,000 heats each year. If the heat is not to these specifications it is not Timken Steel.

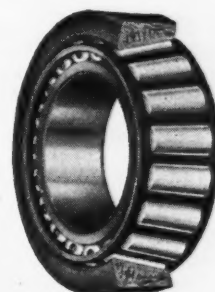
The Timken Roller Bearing Company is the only bearing company which makes its own steel, and its own seamless tubes, and rods, in its own electric steel mill, rolling mill, tube and rod mill.

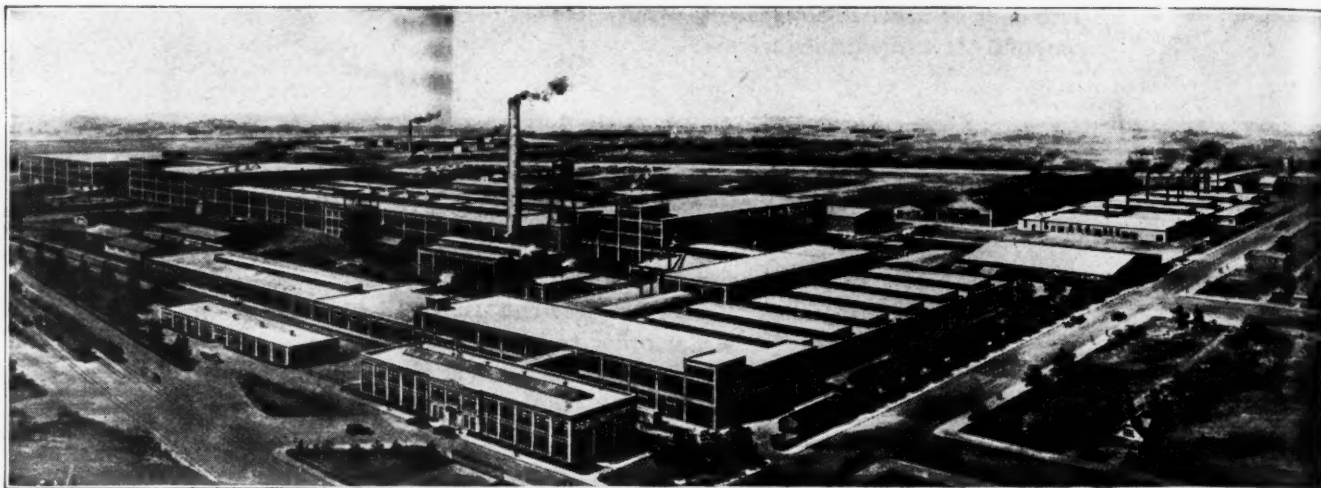
The Timken Roller Bearing Co  
CANTON, OHIO

The Analysis of Timken Steel is:

Carbon	.15— .20
Manganese	.45— .60
Phosphorus	.04
Sulphur	.04
Silicon	.15— .20
Chromium	
(Cups & Cones)	.40— .50
Chromium (Rollers)	1.00—1.20

**TIMKEN**  
Tapered Roller Bearing  
**STEEL**





What the name Prest-O-Lite means is concretely shown by the great Prest-O-Lite factory at Indianapolis, its forty-six acres in the site and sixteen acres of floor space for manufacturing.

## The great plant that makes a great battery

The huge Prest-O-Lite factory at Indianapolis, facing the Speedway, is a familiar sight to almost every man in the automobile industry. Modern to the last degree, it represents the steady expansion made necessary by the growth of the automobile business and the consequent increasing demand for Prest-O-Lite Batteries.

It is here that Prest-O-Plates are made, that the Port Orford cedar separators are given the special Prest-O-Lite treatment, that every part of the battery is rigidly inspected and skilfully assembled. In the testing laboratory here the quality and dependability of the battery is assured. That is why the Prest-O-Lite is the best all-around, all-weather battery.

**THE PREST-O-LITE COMPANY, Inc.**  
INDIANAPOLIS, IND.

New York Office: 30 East 42nd Street

Pacific Coast Office: 599 Eighth Street, San Francisco

In Canada: Prest-O-Lite Company of Canada, Limited, Toronto

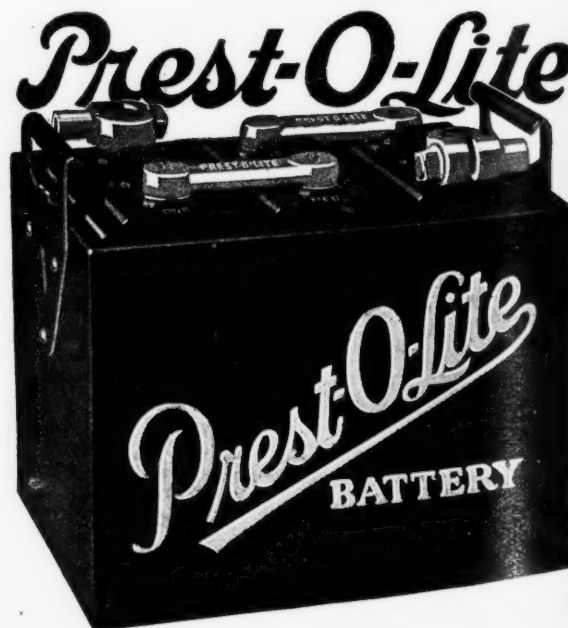
*Be a More Prosperous Dealer*

Battery Stations, service garages, automobile dealers and others who are live merchandisers and interested in having a prosperous, permanent business are invited to write us for our distributor proposition and plan.



The world-famous Indianapolis Speedway faces the Prest-O-Lite plant. In fact, the building of the Speedway is almost a part of Prest-O-Lite history, as it was promoted and established by the same spirit—and it and the factory are the heart of the suburb of Speedway, Ind.

**THE OLDEST SERVICE  
TO MOTORISTS**

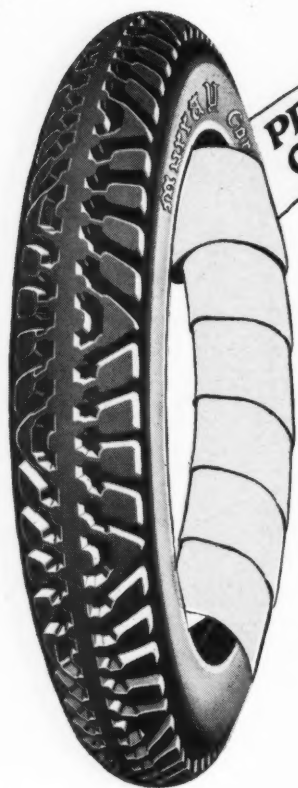






*The* **Crowning  
Achievement**

**Murray**  
"Not A Worry"  
**TIRES**  
FULL OVERSIZE



**PROVEN  
QUALITY**

**SATISFIED  
CUSTOMERS**

**RESTRICTED  
COMPETITION**

**SOLD DIRECT from  
the FACTORY**

**EXTRA  
PROFITS**

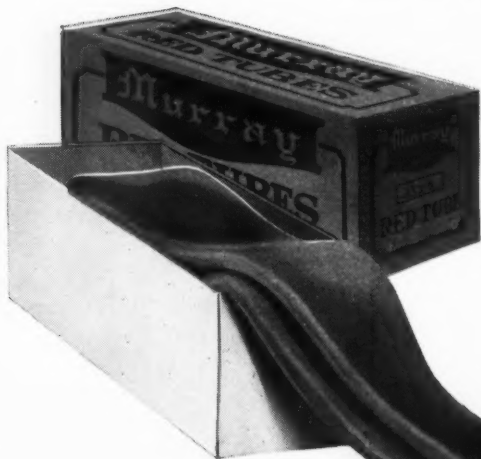
Digging In  
WITH  
**Murray**  
"Not A Worry"  
**TIRES**  
**FULL OVERSIZE**  
CORD FABRIC

**W**IDE awake dealers who enrolled under the Murray banner in 1922 now find themselves firmly entrenched for the battle of 1923. Not only did they do big business last year but they have established themselves in a strong position for even better business now—tomorrow—always.

In the beginning the majority of dealers "took on" Murray tires because of the generous profit they offer—because of their faith in the manufacturers. Today they are re-ordering—in large quantities to meet the demand—because the tires, themselves, have by their performance made good our every claim.

**MURRAY**

is a name with which to fortify yourself against any competition—be it quality or price. Every unnecessary expense has been eliminated to give extra quality to the tire and extra profits to dealers.



**Every Murray Tire  
a Sou'-easter**

Made and tested for the south-east wheel, where traffic is roughest. The reinforcement on the side wall gives "truck-tire" strength where the strain is hardest.

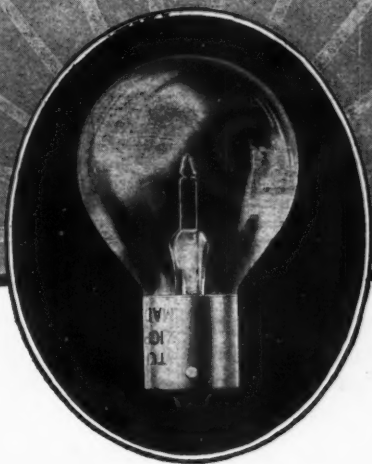
**Write for Our Exclusive  
Dealers' Proposition**

Be the sole distributor in your community for this quality, profit-bearing tire. We will be glad to discuss our distribution plan with dealers and show how we can sell such a good tire at such a low price.

**MURRAY RUBBER COMPANY, TRENTON, N.J.**



# TUNG-SOL



**Q**UALITY is the outstanding characteristic of TUNG-SOL lamps for automotive service. This feature has developed a nation-wide demand. We could build a cheaper lamp, but then it would not be TUNG-SOL. We could build more lamps, but then we might endanger that high standard which has become so much a part of the TUNG-SOL reputation. It is our belief that Quality in lamps is supremely important because safety so often depends upon them. There is an obligation to the motorist which is faithfully fulfilled when TUNG-SOL lights the way.

**MINIATURE INCANDESCENT LAMP CORPORATION**  
Newark New Jersey

*Licensed Under General Electric  
Company's Incandescent Lamp Patents*



**"LET TUNGSOL LIGHT THE WAY"**



## Do You Leave Your Tail Light On—

simply turning off the headlights when you put your car up for the night? Naturally, you turn off all lights, not being satisfied to save merely the "juice" to go into part of the lights.

Then, if bearings are primarily to reduce friction, why not use the type that do that job most completely?

Everybody admits that ball bearings reduce friction to the lowest point known to engineering science. Hence, other types *must* be half-way measures.

The same principle which reduces friction reduces wear. New Departure ball bearings are *not* made adjustable because they never need that feature.

*The New Departure "Brown Book" explains this and more in a very interesting manner. Your copy is waiting for your word to send it.*

THE NEW DEPARTURE MANUFACTURING COMPANY

Detroit

Bristol, Conn.

Chicago





## Are You One of Our Authorized Service Stations?

Are you one of the thousands of dealers who are profiting through this splendid business building plan?

The Boyce Moto-Meter Authorized Service Station Policy was inaugurated to build business for *you*—to open up channels for bigger profits through good-will created by giving *immediate* consumer service.

By service we mean the ability to *please*—whether it be through providing protection for your customer's car through the sale of a new instrument, or maintaining that same protection by making a minor repair on "the most

necessary instrument on his car."

By means of this plan prospective customers are directed to your garage or store. Our national advertising provides for this. But the benefits of the Boyce Moto-Meter Service Station Policy do not stop *there*. By giving *immediate* service you create a confidence in yourself on the part of the customer, which will lead to sales of other profitable merchandise.

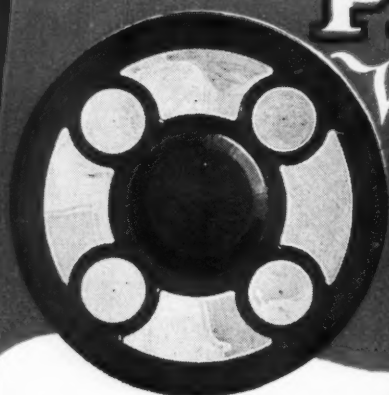
The details of Boyce Moto-Meter Service Station operation are simple, while the results are astonishing. If you have not enrolled, write to-day for information.

THE MOTO-METER COMPANY, Incorporated

Long Island City, N. Y.

# A "Bang up" Timer Proposition

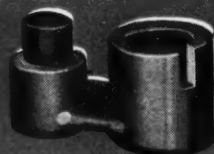
*Write for Details*



THE "BINGO" All-Metal Track

The "all-metal track" and contact points are of brass, imbedded in the molded Bakelite distributing head and extending 1/16-inch beyond its surface. The "raised-track" construction insures long life.

The air-gaps that separate the "all-metal track" from the contact points are something NEW in timer construction. Their purpose is to allow the brush a clean "make and break"—the same method used on armatures for years.



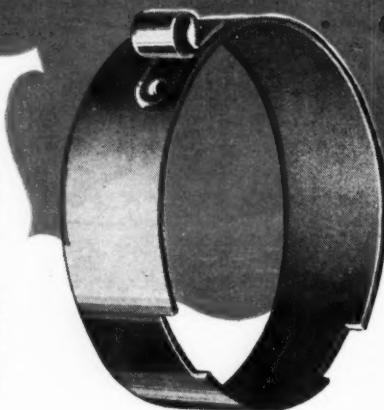
"BINGO" BRUSH and CASTING

The brush is of a graphite and copper composition—and therefore self-lubricating. The rotor is die-cast which insures accurate timing.

"BINGO" DISTRIBUTING HEAD  
—of molded Bakelite and therefore waterproof—also fool-proof against "grounds" and "short-circuits".

"BINGO" TIME HOUSING

The ring holding the distributing head in position is of solid brass, nickel-plated.



Your INITIAL ORDER AT MANUFACTURING COST—that's our proposition to you, Mr. Dealer. We need YOU—your selling talks to your customers—to put the "BINGO" over in a big way.

That's why we are offering you this extraordinary opportunity—we want to pay you well in RICH PROFITS for your time and trouble.

Our display cards and other dealer helps will assist you—bring customers into your store to buy.

Once sold the "BINGO" stays sold and repeat orders will come. For the "BINGO" is an accurate timer—waterproof, fool-proof and unqualifiedly guaranteed.

On a recent blocktest, the "BINGO" timer was run 3500 miles continuously. The micrometer showed practically no wear on the track and only 3-1000 of an inch on the brush. Give your customers such a timer and they'll come back for more.

Fill out the Coupon TODAY. Make a REAL PROFIT on your timer sales.

**The Wm. Deddens Manufacturing Co.**

35 East Front Street, Cincinnati, Ohio

**TIMER**  
**BINGO**  
**FIRES EVERY TIME**

THE WM. DEDDENS MFG. CO.  
35 E. Front St., Cincinnati, O.  
Gentlemen: Send me details of your "BINGO" timer.  
Name.....  
Address.....  
City.....  
State.....





## "We lowered our free service cost with Sunoco"

You who sell cars know all about the free service problem. The best car built suffers when improperly lubricated; and faulty lubrication is the real factor behind the cost of giving free service.

You'll see in this letter how one dealer solved this problem:

"The Studebaker success is national; but our successful year is due to the service behind the sales. And the big factor behind the service is the exclusive use of Sunoco Motor Oils. We tried other oils; but only Sunoco functioned so as to attain the highest efficiency from Studebaker motors.

"Our figures show that we have greatly lowered our free service cost; we entirely eliminated all complaints of fouled plugs, scored cylinders, sticky valves—all originating from improper lubrication."

Sunoco performs this service for any car. Each of its types is straight run, wholly distilled; pure and uniform; high in film-forming quality. Sunoco prolongs a motor's life by giving right lubrication.

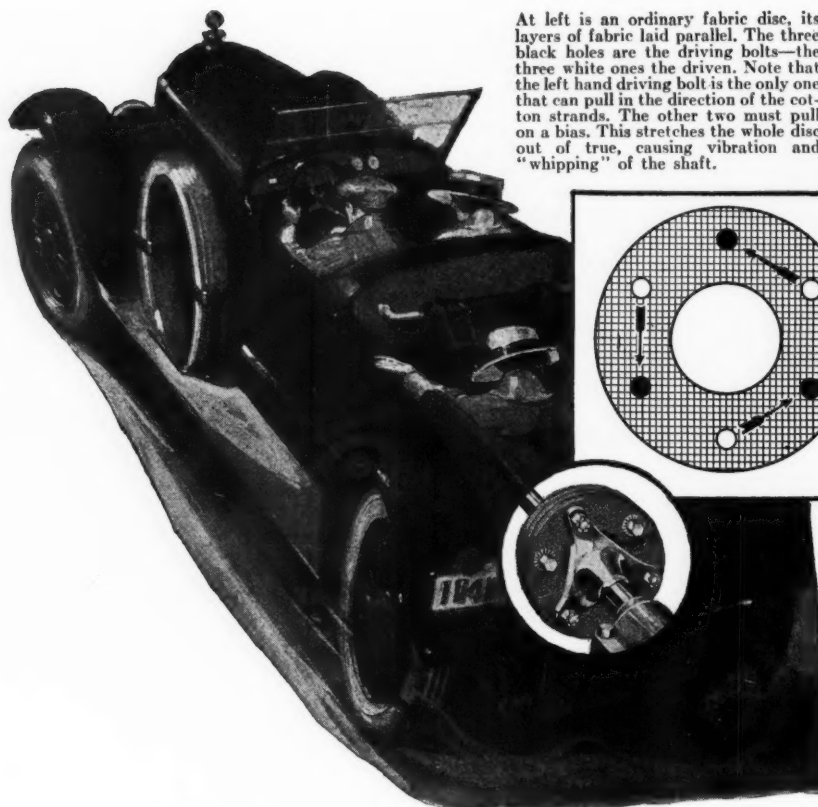
*Sunoco will help you build a reputation for giving real lubrication service. You'll find many useful facts in our booklet, "Making More Money out of Motor Oil." We'll gladly send a copy.*

SUN OIL COMPANY, Philadelphia

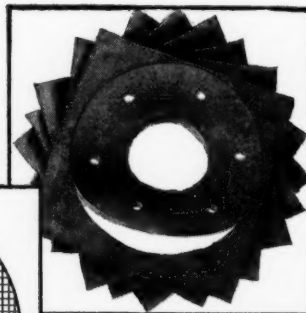
Branches and Agents in Principal Cities

**SUNOCO**  
THE DISTILLED OIL

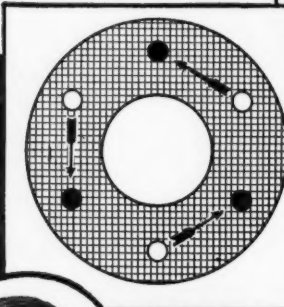




At left is an ordinary fabric disc, its layers of fabric laid parallel. The three black holes are the driving bolts—the three white ones the driven bolts. Note that the left hand driving bolt is the only one that can pull in the direction of the cotton strands. The other two must pull on a bias. This stretches the whole disc out of true, causing vibration and "whipping" of the shaft.



Now examine the Thermoid-Hardy patented Fanwise Construction. The disc is built up with the strands of each fabric layer running in a different direction. Each sector is equally strong, equally elastic. Every stress is balanced—the torsional, the centrifugal, and the lateral. This eliminates vibration and holds the shaft in true on every revolution.



## Protects the delicate gears and bearings

### *One reason why Thermoid-Hardy is replacing metal universals*

**W**HEN the shaft is out of true two or three times per revolution—as frequently happens—it means between 3,000 and 4,500 vibrations. This results in serious damage to delicate gears and bearings in the transmission and rear axle assembly.

The Fanwise Construction of the Thermoid-Hardy Universal absolutely eliminates sudden jolts and "whipping"—it holds the shaft in true on every revolution.

#### *Balances every stress*

The diagram above shows how the famous Fanwise Disc is built up, layer on layer, the strands of each layer of fabric running in a different direction. Each sector is of uniform strength and flexibility. Every stress is perfectly balanced—

- the torsional, between the bolt holes
- the centrifugal, from the center outward
- the lateral, from the forward and back tugs of the shaft.

Your ordinary fabric disc cannot equalize these stresses. With two of the three driving bolts pulling across the strands of cotton the whole disc naturally

stretches out of true. Vibration of the shaft follows.

The Thermoid-Hardy fabric disc is flexible, but added to this is a rugged strength.

Strength that withstands a torsional strain which twists a two-inch steel shaft. Strength good for 60,000 miles on the heaviest trucks, over the roughest roads—without lubrication or adjustment. Strength which absorbs the five-ton blow of starting a loaded truck.

Thermoid-Hardy discs are now packaged for distribution through jobbers and dealers for replacement sales. Full information, prices and discounts sent on request.

#### *A book you should have*

We have prepared a book, "Universal Joints—Their Use and Misuse," that treats the subject from every angle—the mechanical principles, construction, lubrication, process of manufacture, strength, tests, and records of performance. Send for your copy today.

#### **THERMOID RUBBER COMPANY**

*Sole American Manufacturers*

Factory and Main Offices: Trenton, N. J.  
 New York Chicago Los Angeles Detroit  
 Atlanta Seattle Kansas City Boston  
 Cleveland San Francisco London Paris  
 Turin

**LIST OF USERS**  
 Mercer Motors Co.  
 Moreland Motor Truck Co.  
 McFarlan Motor Co.  
 Nelson & LeMoon  
 E. A. Nelson Automobile Co.  
 Nelson Motor Truck Co.  
 D. A. Newcomer Co.  
 O'Connell Motor Truck Co.  
 Oliver Tractor Co.  
 Oneida Motor Truck Co.  
 Packard Motor Car Co.  
 Parker Motor Truck Co.  
 Patriot Motors Co.  
 Reliance Motor Truck Co.  
 Reo Motor Car Co.  
 Reynolds Motor Truck Co.  
 Root & Van Dervoort Eng. Co.  
 Sanford Motor Truck Co.  
 Southwark Fdy. & Mach. Co.  
 Sprague Electric Co.  
 Stoughton Wagon Co.  
 Studebaker Corp.  
 Stutes Mar Tractor Co.  
 Templar Motors Co.  
 Tioga Steel & Iron Co.  
 Towmotor Co.  
 Traffic Motor Truck Corp.  
 Transport Truck Co.  
 Twin City Four Wheel Drive Co., Inc.  
 United Motors Co.  
 Walter Motor Truck Co.  
 Ward La France Truck Corp. Inc.  
 Watson Products Corp.  
 Geo. D. Whitcomb Co.  
 Wichita Motors Co.  
 H. E. Wilcox Motor Co.  
 J. C. Wilson Co.  
 Willys-Overland, Inc.  
 Zeitler & Lamson  
 Truck & Tractor Co.

**LIST OF USERS**  
 American British Mfg. Co.  
 Allis Chalmers Mfg. Co.  
 Anderson Motor Co.  
 The Autocar Co.  
 Available Truck Co.  
 Barley Motor Car Co. (Roamer)  
 Crow-Elkhart Motor Corp.  
 Jas. Cunningham Son & Co.  
 Dart Truck & Tractor Corp.  
 The Dauch Mfg. Co.  
 Diamond T Motor Car Co.  
 Doane Motor Truck Co.  
 Elgin Motor Car Corp.  
 Elgin Street Sweeper Co.  
 Fageol Motors Co.  
 Fifth Ave. Coach Co.  
 H. H. Franklin Mfg. Co.  
 Garford Motor Truck Co.  
 Gramm-Bernstein Motor Truck Co.  
 Handley Knight  
 Hawkeye Truck Co.  
 Hendrickson Motor Truck Co.  
 Highway Motors Co.  
 Holt Mfg. Co.  
 Indiana Truck Co.  
 International Harvester Co. of A., Inc.  
 International Motor Co.  
 Jackson Motors Corp.  
 Kelsey Motor Co.  
 Kentucky Wagon Mfg. Co., Inc.  
 Kenworthy Motors Corp.  
 King Motor Car Co.  
 King Zeitler Co.  
 Lakewood Eng. Co.  
 Larabee-Deyo Motor Truck Co.  
 Lexington Motor Co.  
 Locomobile Co.  
 Menominee Motor Truck Co.

## THERMOID-HARDY UNIVERSAL JOINT

Makers of "Thermoid Hydraulic Compressed Brake Lining"  
 and "Thermoid Crolide Compound Tires"





# PIERCE ARROW



The buying of Pierce-Arrow Motor Cars is by no means restricted to the large centers of population or to people of wealth.

More than ever before the demand for our product is spreading among those fine people everywhere—in the smaller communities as well as in the great metropolitan cities—who desire the certainty of long, reliable service, and the unquestioned prestige, that go with the Pierce-Arrow Motor Car.

An investigation of the Pierce-Arrow dealership might reveal some unthought-of profit possibilities in your locality during the coming summer season.

## THE PIERCE-ARROW MOTOR CAR COMPANY

*Buffalo, New York*

Open Cars    ∴    \$5250

Closed Cars    ∴    7000

*At Buffalo—War Tax Additional*

Watch the following  
issues of this publica-  
tion for the unveiling  
of this remarkable car!

\$750  
f. o. b. Factory



## Will You Be the Lucky Dealer?

One of America's largest and most influential automobile manufacturers, now producing one of the fastest selling lines of automobiles on the market, is about to announce a new car, which will list at \$750.

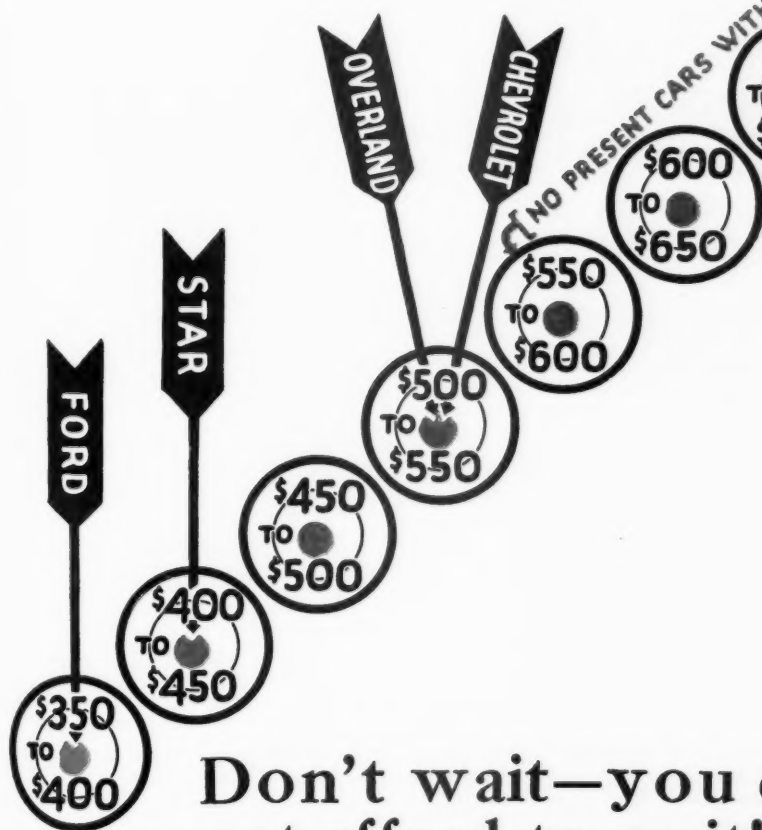
This car will instantly command a tremendous untouched market. A car of generous proportions, it will offer all the comfort of cars selling around \$900, at a price \$150 less. Equipped with cord tires, bumpers

front and rear, khaki top and numerous other details of refinement.

With the prestige and reputation of its manufacturer, it will immediately dominate a market all its own, and the lucky dealer who makes application to handle this line now will, in addition, be granted the privilege of handling the established models, of which more than a hundred thousand will be built this year.



To dealers, the advent of this new car opens up an entirely new price field. Between the cars in the \$500 to \$550 class and cars in the \$850 to \$900 class there is an unfilled gap—a tremendous new market that this new car serves! Alone in a class of its own. Without competition! Here is the money-making opportunity of a lifetime.



NO PRESENT CARS WITHIN THESE PRICE RANGES



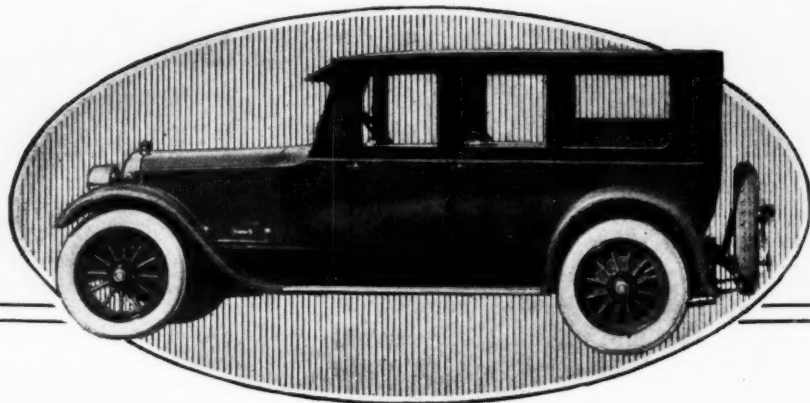
Don't wait—you cannot afford to wait! No matter what line you are now handling, you cannot afford not to be aboard this wonderful opportunity. Address—

"Leading Manufacturer,"  
care Dept 21

MOTOR AGE, 5 So. Wabash Ave., Chicago, Ill.



*"Tony Lederman's Compressor served this car—*



*—and today—it's serving  
THIS one!"*

## BRUNNER



### 2-Stage 1923 Model

*with 20 Exclusive Features a  
few of which are:*

2. Extra large intercooler insures low temperature for second stage.
4. Improved Belt Tightener with Hardened and Ground Shafts and Oil-less Bearings.
5. Ground Bearings, Cylinders, Pistons, Piston Rings, Wrist Pins and Crankshaft.
6. Removable Cylinders—making repair and replacement cheap and easy.
7. Forked-type Connecting Rods—minimizing the vibration common to heavy solid construction and in most 2-stage compressors.
11. Every part Built on Special Tools and Gages insuring absolute interchangeability.
15. Seamless Steel Tank—insures absolute safety. The only compressor made using this expensive type of tank.
17. Solderless Compression Couplings of most efficient type.
18. Brunner Patented No. 73 Safety Valve—Absolutely Air Tight.

## Cost Per Year!

*Pin this maxim in your hat:*

*"Good Equipment Costs Less!"*

WE'RE going to talk about Tony Lederman and his Compressor, because they illustrate this point.

In 1908 Tony Lederman bought a Brunner. He has it yet. And it's giving him perfect satisfaction.

Since he bought that Compressor, he's had a new cash register, a new telephone, new linoleum on his office floor, new tools, many and many a time he's had to rebuild or replace most of his office and shop equipment.

But he still has the same Brunner Compressor—after 15 years. And it's *still* in good shape.

If you ask Tony Lederman: "How much has that compressor cost you?" he's likely to answer: "How much has it saved me, you mean! Why that machine has paid its purchase price several times over, and the cost of repairs has been so small as to amount to nothing."

The "20 BRUNNERISMS" (established habits of mechanical excellence) not only make machines that last long, but that run well *continuously* while they are lasting.

*Your Jobber Carries Brunners. Ask HIM About Them.*

**BRUNNER MFG. CO., Utica, N. Y.**

*Oldest and Largest Manufacturers of Garage Air Compressors in the World*

Cincinnati  
1st Natl. Bk. Bldg.

Kansas City  
1805 Grand Ave.

San Francisco  
607 Santa Fe Bldg.

*"Good for Twenty Years at*

**BRUNNER**  
AIR COMPRESSORS

*Hard Labor!"*





## Stop This With Snubbers

**H**OW many times have the rough spots shaken all the pleasure of the trip out of you?

Gabriel Snubbers give you comfort by keeping the springs under control and smoothing out the bumps. Endorsed by the manufacturers of 71 cars.

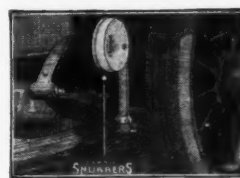
*Sold by legitimate dealers*

GABRIEL MANUFACTURING COMPANY  
1415 East 40th Street Cleveland, Ohio



# GABRIEL SNUBBERS

THERE IS NO OTHER

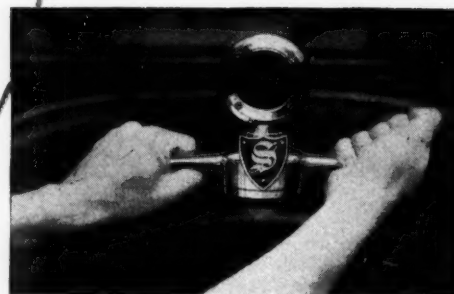


Keep You On The Seat—Save Your Car

# MONOGRAM

*The*  
ORIGINAL  
Self Locking Radiator Cap

Sells Because  
It Screws On  
-But Not Off



**N**o setscrews, toolwork or fussing — no complications when installing. Takes only a minute. The quickest and easiest way to earn your profit.

It can't be screwed off without turning the whole car upside down, unless the radiator is removed. How many crooks would go to that trouble? How many could?

So you get an easy profit, and your customer gets protection for his motor meter, besides a lot of other advantages.

Ask any Monogram distributor.

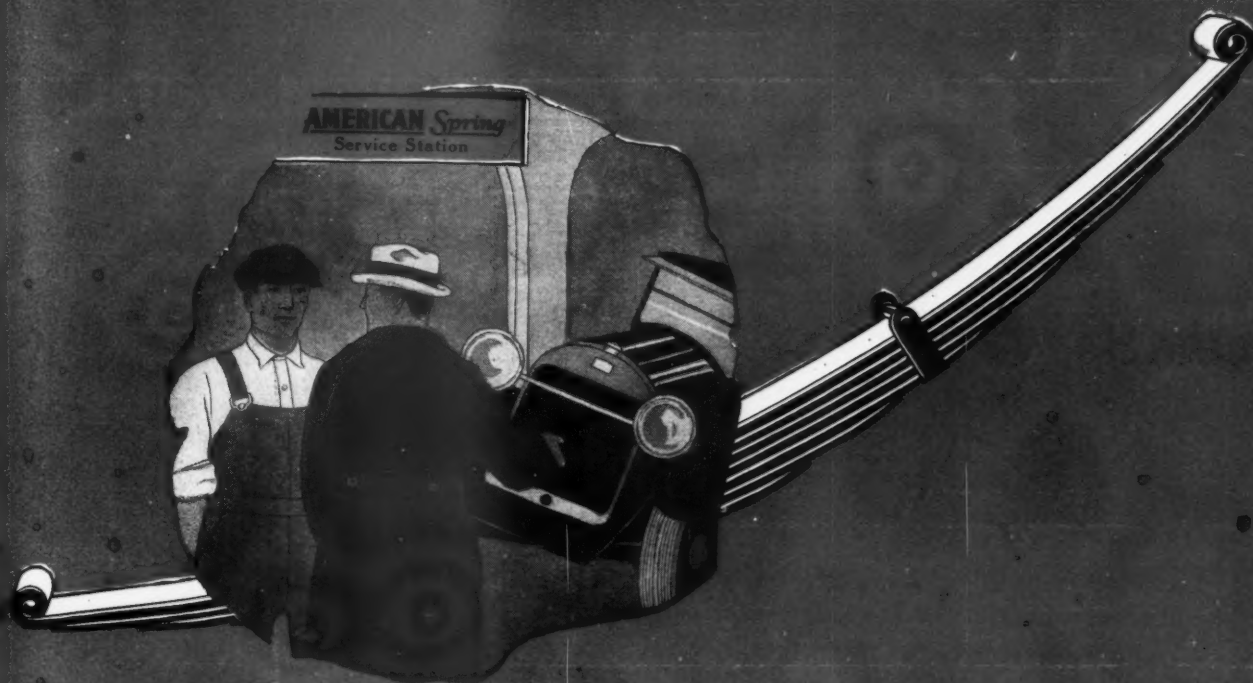
**SENIOR**  
For Every Car Made

**JUNIOR**  
For Ford, Chevrolet 490,  
Gray, Star and Overland 1923

**GENERAL AUTOMOTIVE CORPORATION**  
600 West Jackson Boulevard  
Chicago, Illinois







*"When Can I Get Her?"*

*"Oh in about half an hour. I can slap in a new AMERICAN spring in no time. I carry them in stock and they fit."*

AMERICAN Spring service stations live up to such promises because AMERICAN Springs are accurately built to go into place without adjustment or fussing. And the satisfaction the customer takes in getting his car back on time grows daily as he learns how good his new spring really is.

# **AMERICAN Springs**

**AMERICAN AUTOPARTS COMPANY**

9775 French Road

Detroit, Michigan

*Write for Catalogue*

*Distributors Everywhere*

# Sell a car you can recommend to your best friend!

Far-sighted dealers, who recognize the importance of *good-will* in building a permanent business, should represent the Oakland.

Oakland is this year's outstanding success! Oakland sales are steadily mounting because of the many definite superiorities Oakland offers over any other light-six.

Oakland's "Mileage-Basis Plan"—its special, written, 15,000 mile engine guarantee—the beauty and comfort of its bodies—its wonderful economy and endurance records—all these things form an asset of tremendous value to Oakland dealers.

In Cleveland last year—where service stations keep accurate records—it cost an average of only \$8.06 per car for upkeep. Other cities report similarly low averages.

Surely your own business judgment must convince you that Oakland has a car that will build a sound, profitable and growing business for you.

Wouldn't you like to represent Oakland? Wouldn't you like to sell a car that you could honestly recommend to your best friend? Certain territories are not adequately covered—write the factory!

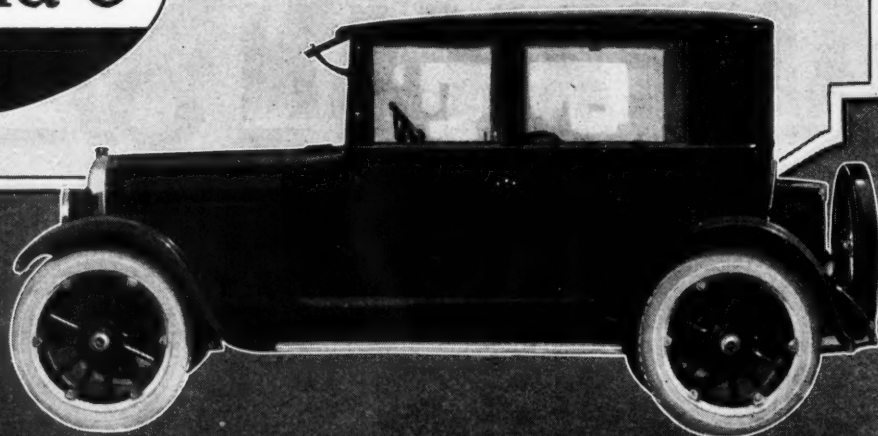
**Oakland Motor Car Company, Pontiac, Michigan**  
Division of General Motors Corporation

## The 1923 Oaklands

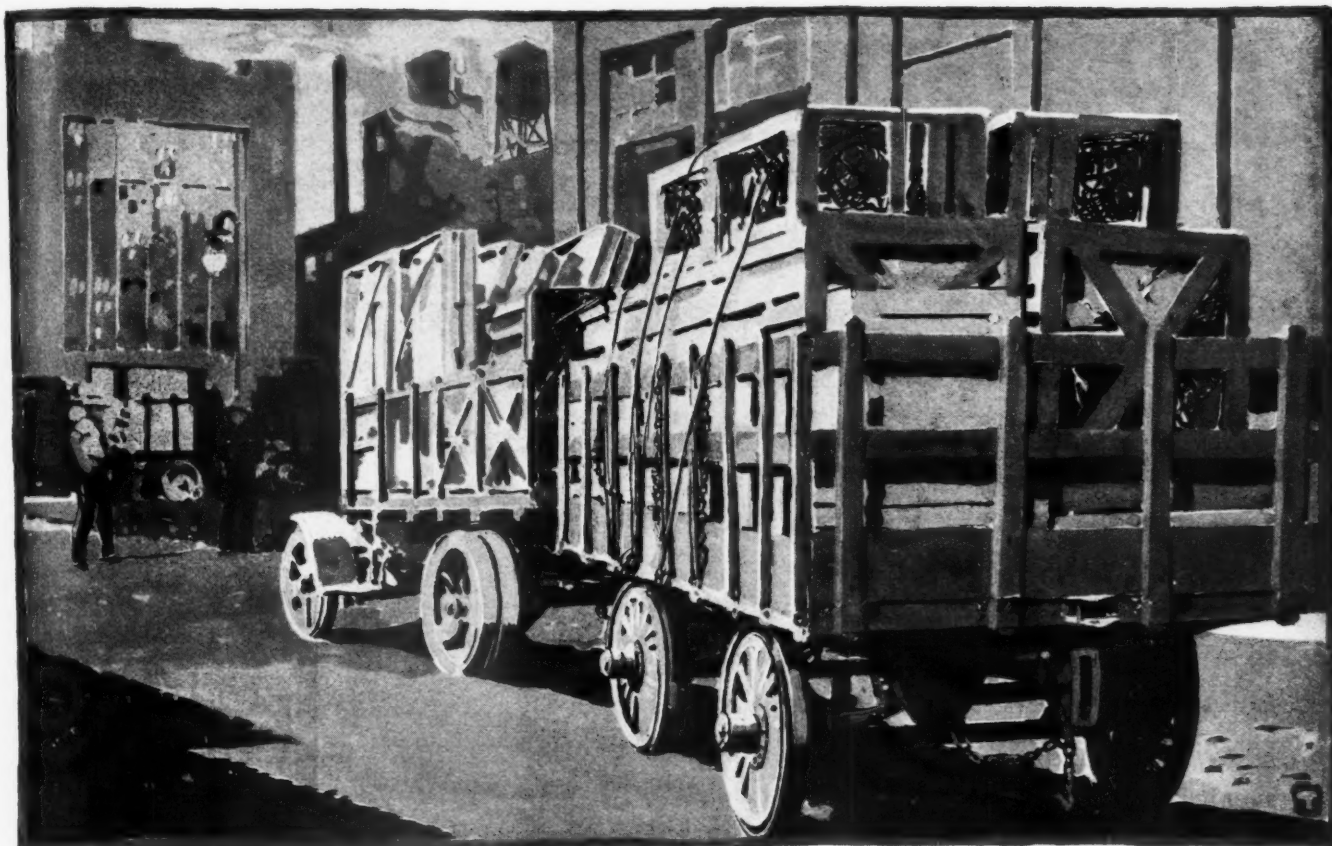
Roadster	\$ 975	Sport Touring	\$1165
Touring	995	Coupe, 2-Pass.	1185
Sport Roadster	1145	Coupe, 5-Pass.	1445
Sedan, 5-Pass.			\$1545

F. O. B. Pontiac, Mich.

# Oakland "6"







# Truck Dealers

If you can sell trucks you can sell TRAILERS.

Thousands of TROY TRAILERS are hauled in connection with trucks throughout the United States.

The sale of these TRAILERS represents a profit to the dealer.

It is possible that your territory has not been allotted.

Write us. TODAY.

**The Troy Trailer & Wagon Company**

Mulberry Street

Troy, Ohio

# 25% More Profit

for you on a quality  
plug that you know

## Mosler Spit Fire

*Made Since 1898*

And to make the Spit Fire distinctive—to make it stand out—from all other plugs—we put a Red Vulcanized Fibre Cap over the insulator which also prevents accidental porcelain breakage.

Only made in six sizes—and these six will fit every car on the market.

Dealers who *think*—find in Spit Fire a source of profit with satisfaction to their customers.

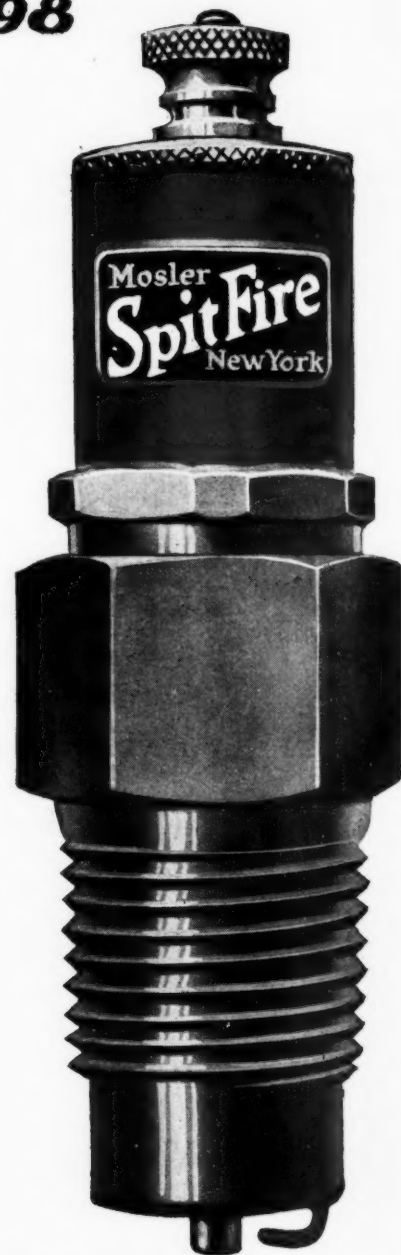
Get Spit Fire facts—you can't afford to neglect 25% more profit on a smaller investment!

Send us your card or letter head.

MOSLER METAL PRODUCTS CORP.

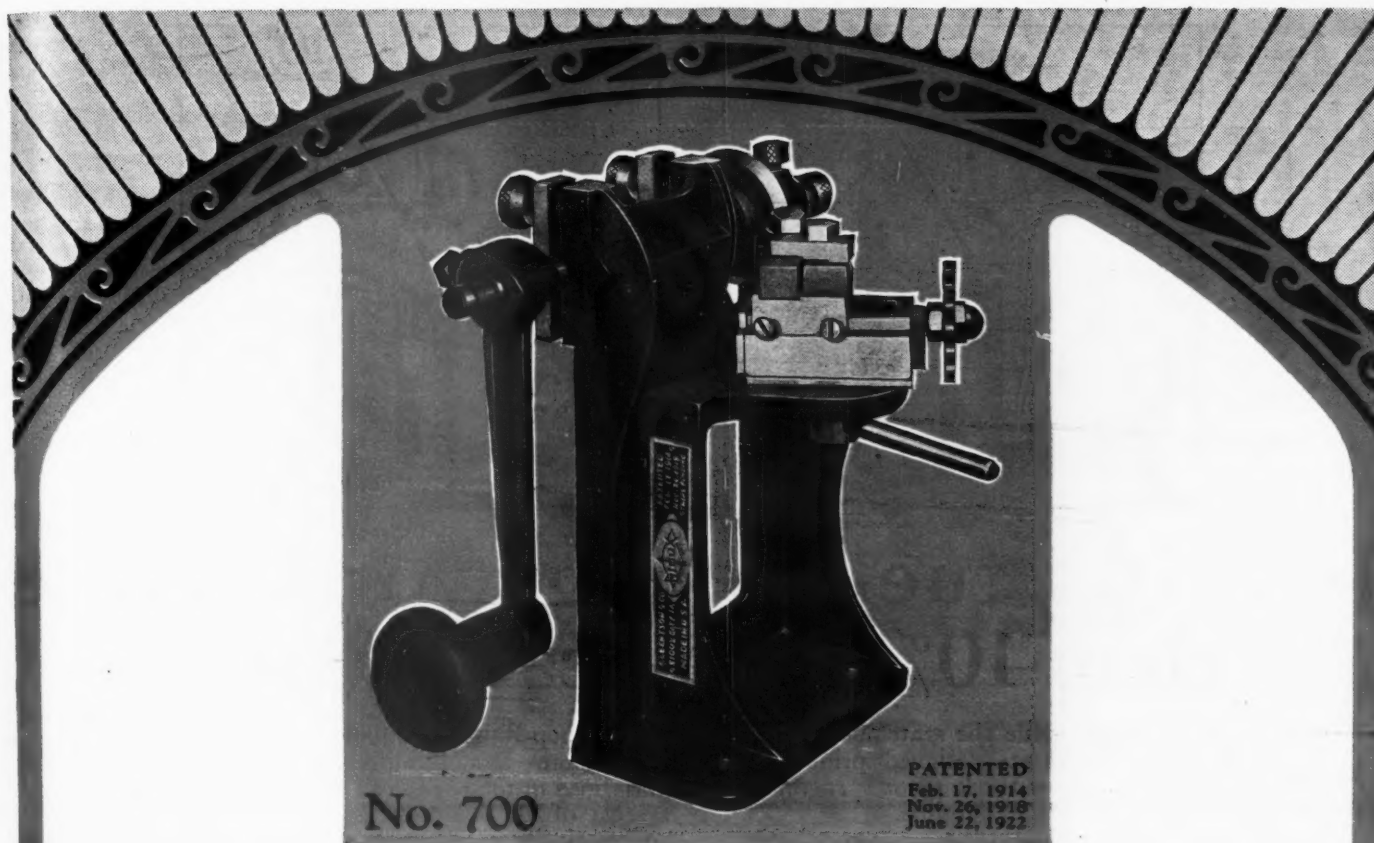
Mt. Vernon, N. Y.

Export Representative:  
Auto Sundries Co.  
New York, N. Y.



"Spit Fire"—a name as old as the industry





## Little Sioux Valve Lathe

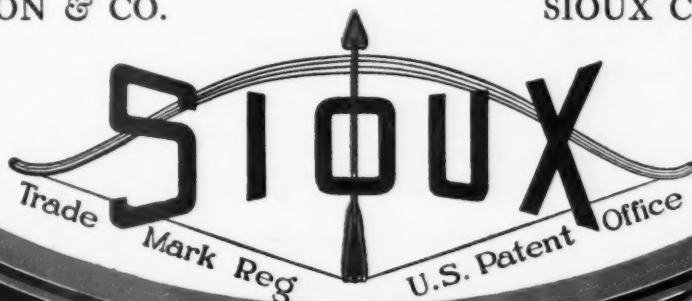
Give your shop a square deal by equipping it with reliable and accurate tools. Good tools will pay 100% dividends.

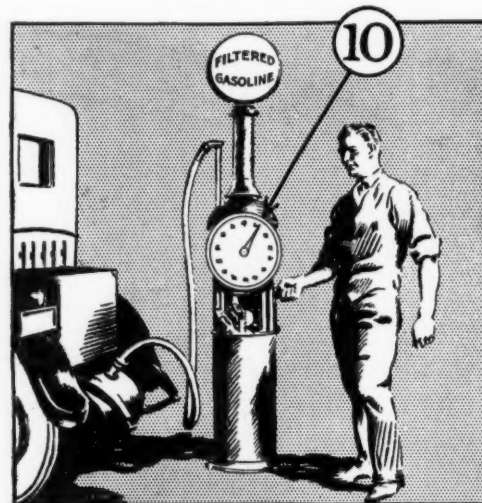
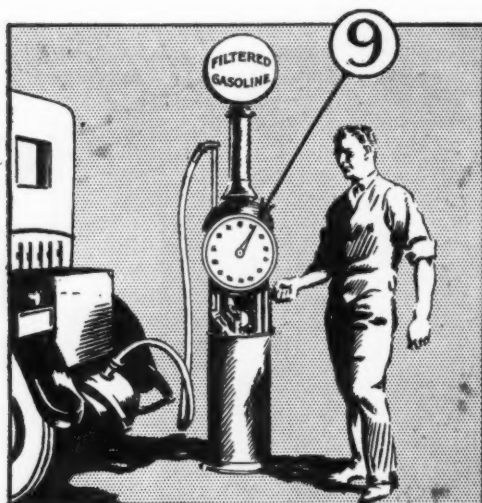
The "Little Sioux" Valve Lathe fills a need in every shop. Refaces valves up to 2½ inches, either 30, 45 or 60 degree angles. Is simple, self-adjusting and absolutely Accurate. Investigate "Sioux" Tools and learn why they build business and insure greater shop profits.

**Sold by All Live Jobbers**

Write for Catalogue and Valve Seat Reamer Specifications  
**ALBERTSON & CO.**

**SIoux CITY, IOWA**





## Is a 10% fuel saving worth more than 10% to the car owner?

Repeatedly we have made the statement that the Bishop-Babcock Aquastat—designed primarily to give your automobile or truck *summer engine performance all the year*—saves gasoline.

In actual tests this saving has been as high as 35%. Hardly a test has been made when it amounted to less than 10%. What does this mean?

Perhaps a 10% fuel saving is of no particular consequence to you. Perhaps you would just as soon pay for 10 gallons of gasoline when nine gallons would deliver the same mileage.

But there is another factor to consider. You have established the requirements of your car, the amount of fuel required to operate it efficiently. When you burn more, what happens?

### Note this extra saving

Right there lies the answer to most engine troubles. When you feed more gasoline into the combustion chamber than is required for actual operation, this extra fuel is not entirely consumed—it smokes and forms carbon to score your cylinders, or it works its way into the cylinder oil and dilutes it.

A 10% fuel saving, therefore, *is* worth more than 10% to the car owner. Not only do you save yourself 10% in cash, but you also save overhauling of the engine, regrinding of cylinders and waste of lubricating oil.

The Bishop-Babcock Aquastat will save you 10%—and more—in all localities where there are marked variations in temperature. Attached to the cooling system of all pump-operated cars and trucks, it automatically maintains a constant temperature in the combustion chamber, insuring an even, economical consumption of fuel.

### What the Aquastat will do

Repeated tests under all conditions have definitely established these benefits from the use of the Bishop-Babcock Aquastat:

(1) Adjusts the water cooling system to seasonal requirements; (2) Maintains constant temperature in the water surrounding the combustion chamber and cylinders; (3) Prevents over-cooling of engine in cold weather; (4) Warms up engine quickly in cold weather and reduces use of choke; (5) Saves fuel by preventing recondensation and by permitting use of less gas; (6) Reduces carbon deposits from excess fuel; (7) Prevents diluting of oil in crankcase by excess gasoline; (8) Allows a 10% seepage at all times to check danger of freezing.

The Bishop-Babcock Aquastat is manufactured and guaranteed by the manufacturers of the "world's most complete line of heating specialties." We invite tests from automobile and truck manufacturers and dealers.

**THE BISHOP & BABCOCK COMPANY**  
Automotive Specialties Division, Cleveland, Ohio

# Bishop-Babcock AQUASTAT

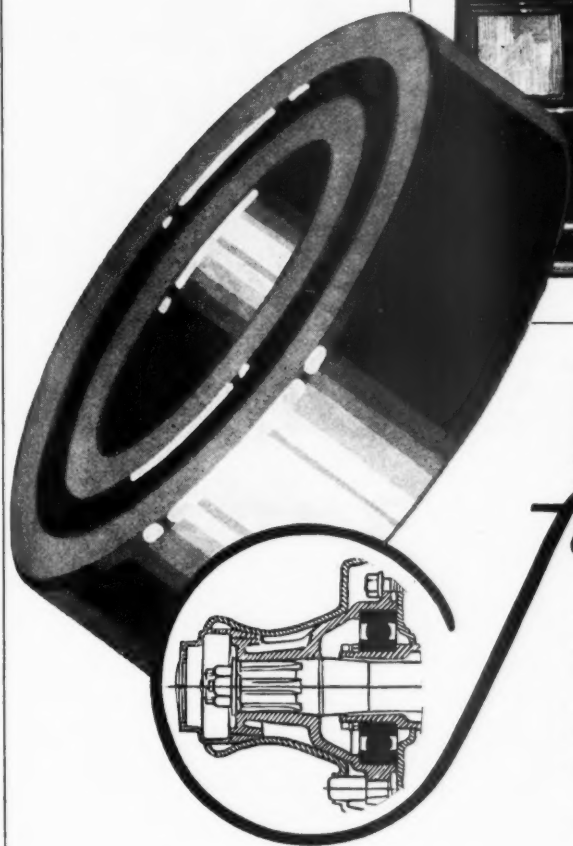


Retail price  
\$10.00

Easily and quickly  
installed

Two hose sizes  
1 1/4" and 1 1/2"





# BEARINGS

*for every application*

Annular Ball Bearings for wheels, pinion shafts, clutch pilots, transmissions & all other automotive applications carried in stock at each of our 37 Branches. This is but one of the lines carried at our branches to give you prompt service

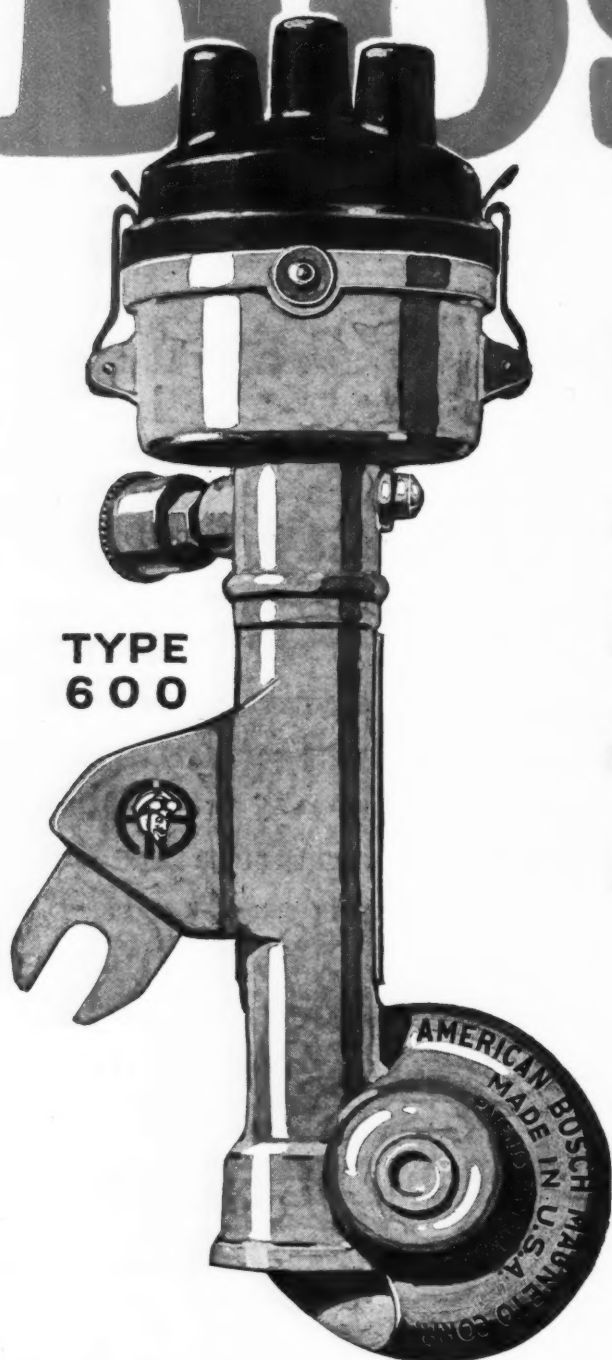
## BRANCHES

*In thirty-seven cities!*

# AHLBERG BEARING COMPANY

321 East 29<sup>th</sup> St. Chicago

# *The new* **Bosch**



*What every  
Ford Owner  
has wanted—  
and dealers  
have needed*

*Here's value with a  
vengeance!*

A big, rugged, waterproof ignition system for Fords—built by the makers of the world famous Bosch Magneto—and selling at only \$12.75.

It has automatic spark control, scientifically accurate timer, and is the longest lived Ford ignition system you can buy under \$25.00.

It's a quick, easy seller—and a big profit maker.

**The Bosch De Luxe System,  
Type 513,**

is made for Fords using storage batteries. This system, which includes the Bosch Coil and Compensating Governor, becomes a definite part of the engine. It is extremely popular, as it gives wonderful service—thousands are sold monthly. Price is \$25.00 complete.



# Ignition System *for* Fords

**IT WILL—**

Keep a crowd around your booth at the auto show—

Bring new customers into your store daily—

Keep the boys in your shop busy making installations—

Keep your stock turning over rapidly at a liberal profit—

Make sales easy for your salesmen—

Widely advertise your place, and greatly increase your prestige—

Make 1923 a record breaker in sales.

Type 600 sells on sight! It looks like \$25.00 worth, and works still better.

Every customer becomes a booster. You sell him, and he sells his friends—

Get started! Thousands of dealers are making this their 1923 leader—it's going to be a Bosch-Ford year.

Wire for sample fitting C.O.D. and full particulars about New Sales Plan.

**AMERICAN BOSCH MAGNETO CORP.**

Springfield, Mass.

YORK

CHICAGO

DETROIT

SAN FRANCISCO



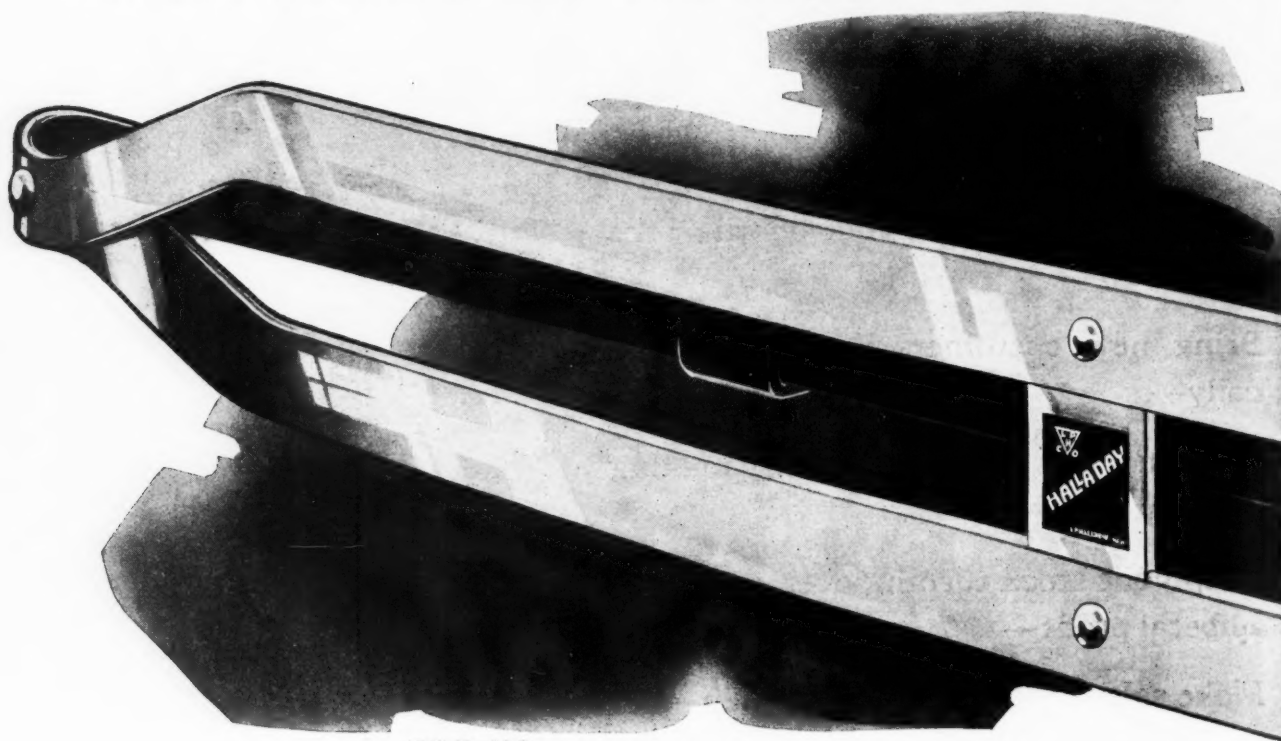
## What it does

- 1—Makes Easy Starting
- 2—Keeps Plugs Clean
- 3—Prevents "bucking"
- 4—Gives More Power
- 5—Saves Gas and Repair Bills
- 6—Stops Timer Troubles
- 7—Pays for Itself
- 8—Prevents Short Circuits
- 9—Cuts Down Vibration.
- 10—Eliminates Spark Lever

\$12<sup>75</sup>/<sub>100</sub>

# HALLADAY

"The GOOD OLD NAME Means Better Bumpers and Shock Absorbers"



Full Doubleface

## Strength—With Light Weight

All bumpers look right in the pictures. The big thing is to make them as good as they look. "Halladays" are.

Our method of using high quality spring-steel, hardened in oil and drawn to proper temper in our scientifically heat controlled furnaces, provides real strength.

Distinctive appearance, made possible through our design and heavy nickel plating over rust-preventing buffed copper,

offer additional reasons why car owners choose "Halladays."

\*Good jobbers everywhere stock them.

Write for catalog, prices, discounts on the complete "Halladay" line.

\*"Full Doubleface"

\*"Doubleface"

\*"Singleface"

\*"Light Car Special"

. . . four distinct designs that meet every bumper demand.

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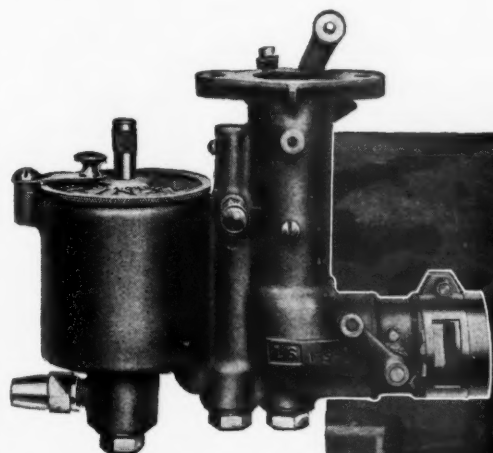
L.P. HALLADAY COMPANY, DECATUR, ILLINOIS, U.S.A.

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# ZENITH



## Making San Francisco's Milk Supply Certain

*Those qualities that make Zenith preeminent in exceptionally difficult service, also make it best in ordinary service.*

*All Zeniths are built on the same time-proven principle; and there is a model for every automotive engine.*

The United Milk Company's heavily loaded trucks, pulling one and two trailers of the same capacity, make the round trip from Solidad to San Francisco—268 miles—every twenty-four hours.

This practically continuous service—maintained by relays of drivers—brought new and unexpected problems; among them, rapid wear of their carburetors due to the constant vibration.

The Zenith, primarily because there are no valves, springs, toggles or other fragile parts to wear or lose their adjustment, solved their problem fully and permanently.

This is but one of literally scores of cases where Zenith has filled the needs that no other carburetor could meet; but one of hundreds of installations where the necessity of the utmost in dependability, economy, or performance has dictated Zenith Carburetors.

**ZENITH CARBURETOR CO.**

New York

DETROIT

Chicago



## A Good Pump Sells Much More Than Gasoline

**E**VERY motorist must have gasoline, but before he stops at your door, *he must see your pump.*

Every Gilbert & Barker pump is built for quick, safe, accurate gasoline service. It is *also made to be seen.* Through its handsome appearance and large advertising space it will attract the attention of every car that passes and give out a compelling invitation to pull up at your curb.

And every car that stops offers you the gilt edge opportunity to "ask them to buy" other things. Many dealers have specialized in this and have found it pays mighty good profits.

There's no reason why you shouldn't cash in on this idea too. Get a Gilbert & Barker pump that will *stop* them then you can sell them anything else they ought to have.

*Ask your oil man today for information and prices on Gilbert & Barker equipment. In case he cannot supply it, write us giving his name and address.*

### Things you should know About Gilbert & Barker Pumps

1. Gilbert & Barker pumps are made by one of the largest manufacturers of measuring pumps in the world.
2. Their positive piston stroke principle of operation has been proved by years of service to be the safest, quickest and most accurate method of measurement.
3. Engineering skill has simplified construction to the fewest possible parts. There is no intricate or delicate mechanism to get out of order.
4. The operating mechanism of the pump is completely enclosed and protected from dirt, dust, and bad weather.
5. The quick return of the piston which is automatic and doesn't have to be cranked down, saves the time and energy of the operator.
6. The square deal dial and quantity indicator gives visible evidence of accurate measure to your customers.
7. The handsome appearance of G & B Pumps and their ample advertising space attracts trade, builds business and increases profits.

**GILBERT AND BARKER**  
MANUFACTURING COMPANY  
GASOLINE AND OIL STORAGE EQUIPMENT  
SPRINGFIELD, MASS.





### Interlocking-Joint

Piston rings determine the life of any motor overhaul! Only so long as the rings hold compression and keep out excess oil, does the cost of reconditioning pay returns.

This vital importance of piston rings has created sweeping preference for the Gill—Special—Servus line.

Individually cast of special grey iron that indomitably resists wear; and lathe-turned for quick seating, one of the three types — Gill — Special — Servus,

will safeguard to the utmost the investment in repairs.

Gill Interlocking-Joint, 75c; Special Oil-Wiper, 50c; Servus Step-Cut, 30c — each offers maximum protection in its field, and extreme durability at a substantial saving.



Stocked by leading jobbers everywhere, supported by 36 factory branches. 11,000 sizes and oversizes quickly available. The right rings and the right service for building business.

### GILL MANUFACTURING COMPANY

8300 South Chicago Avenue, Chicago

Canadian Factory—415 King St. W. (Brown Engineering Co.), Toronto  
Sole Canadian Distributor—Canadian General Electric Company, Limited  
Export—American Steel Export Co., Woolworth Building, New York City

# Special

Oil-Wiper



# Servus

Step-Cut

# 30 MILLION

## SHALER

### VULCANIZED PATCHES

### Were Used

### in 1922



## Every Sale Brings Repeat Sales

Every sale of a Shaler 5-Minute Vulcanizer makes a steady customer for Shaler Patch-&-Heat Units. Your profits mount up like compound interest at the bank. Every sale pays you a good profit and establishes a steady repeat sale business that is also profitable.

Every motorist who buys a Shaler 5-Minute Vulcanizer must come back to buy Patch-&-Heat Units for use in his Vulcanizer. It is just like buying a safety razor — its useless unless you have razor blades to use with it.

## Write for Free Window Display

Signs, cards, cutouts, posters, everything you need to make a fine display on your counter or in your window, are yours for the asking. Also circulars to mail out. Ask for them.

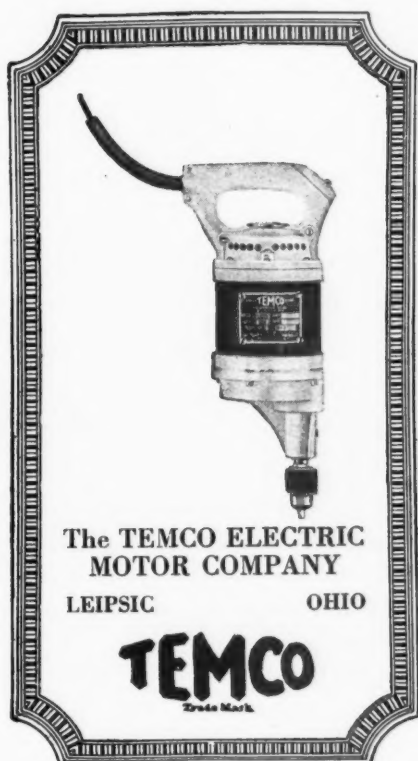
**C. A. Shaler Company, 212 Fourth Street, Waupun, Wis.**





Jacobs  
Quality  
Chucks

## What Are Your Mechanics Doing?



When you need chucks,  
just ask your jobber for  
Jacobs. He has them in  
stock.

The best way to determine why a shop is making money, or why it isn't, is to look and see what the mechanics are doing.

If the shop **isn't** making money, you'll probably see the men sweating over a job that a machine would have done a good deal better and in a fraction of the time. Here they're working on the discredited theory that "the customer pays for the time, so what's the difference?"

The difference is clear enough to the customer when he compares the bill with that from another and better equipped shop.

And that's the difference between making money and losing it. Good equipment permits fair prices at an adequate profit, as well as insuring better jobs and vastly improved working conditions.

### Installing a Foot Rail



A foot rail, which is constantly being moved back and forth, must be very firmly held at the base. This means good clean holes through the floor—essentially a job for a portable electric drill, where nothing is left to nervous or tired hands. You just **GUIDE** it; the current from your electric light socket will do the rest.

THE JACOBS MFG. COMPANY, HARTFORD, CONN.

*This advertisement inserted in the interest  
of better Service Equipment in general and  
the use of Portable Electric Drills in particular*

"Good Mechanics Prefer Good Machine Tools"

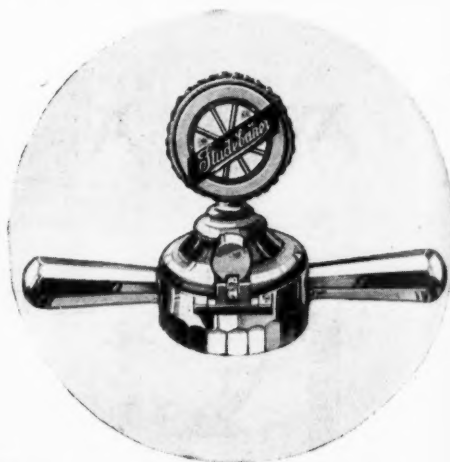


# Utilities-Not EXCESSories!



*The Snappy Cap for Fords. Press the trigger, cap flies open for filling. Give the radiator its drink, click it closed. Snappy locking—snappy looking.*

*Utility, NOUN. Fitness for some desirable, practical purpose; serviceableness; also that which is serviceable. SYNONYMS: advantage, benefit, PROFIT, service, etc. STANDARD DICTIONARY.*



*The de luxe model Snappy Cap. Harmonizes with fittings on the finest cars. As pretty a utility as ever perched on a car's radiator.*

**B**ETHLEHEM BETTERMENTS are not pretty gim-cracks which merely take a car-owner's money and give him little in exchange. They are not EXCESSories, nor even accessories in the accepted sense, but actual utilities that serve a purpose in addition to their obviously good looks.

The Snappy Caps save many a scorched finger, and make filling the radiator a matter of seconds. There is a Snappy Cap for every car that rolls on rubber. Bethlehem Spark Plugs are more than "just plugs." They spit sparks deep into the firing-chamber every time. Standard equipment on White Trucks, International Trucks; Packard, Studebaker, Stutz and other good cars.

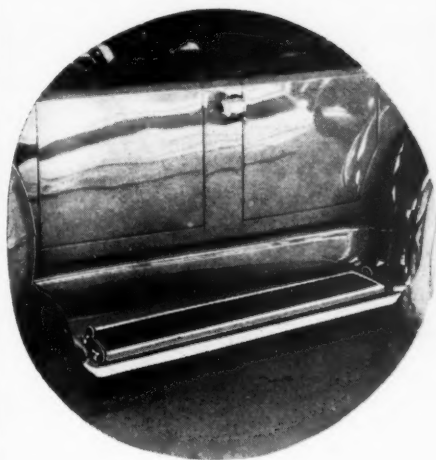


*This is the No. 8 Spark Plug (Ford Part 5200). Long-reach type that fires the charge in dead center. Five millions of them now getting the most out of the gas in Ford cylinders.*

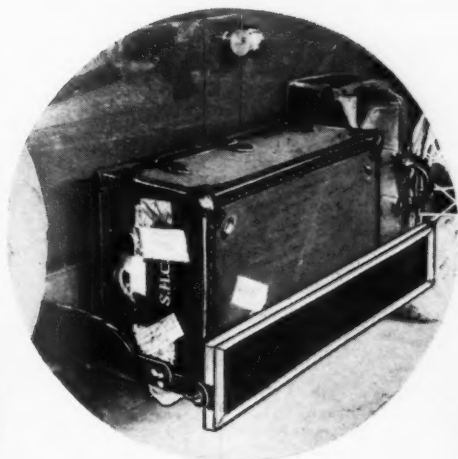
# Bethlehem betterments



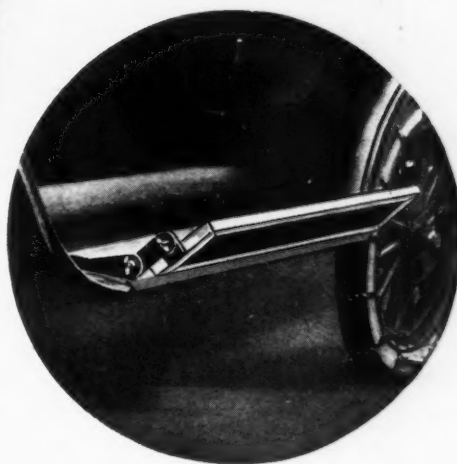
# That's Why They Sell!



*This is the C-Special Wrench-Set, very popular with car-owners and garage-men alike. Has ratchet handle, L-handle, short bar for close clearances, and 8 deep hex sockets, all packed in a neat wooden box. Practical!*



*Bethlehem Tourack—"Carries Your Luggage." The good-looking, rattle-proof, built-to-last-a-lifetime luggage-carrier that has taken the motor world by storm. A size for every car.*



*Mechanics' "D" Set. Has ratchet handle, L-handle, T-handle, three short bars and universal, and 23 deep hex sockets from 9/32" to 15/16" by thirty seconds. The last word in socket-sets. Fitted in neat, hardwood box with hinged lid.*



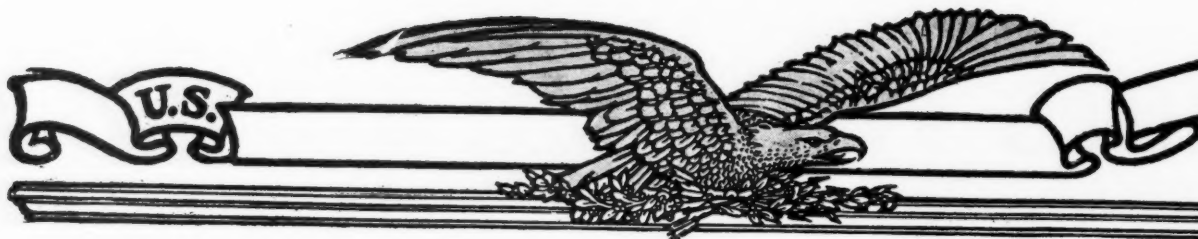
**T**HE new Bethlehem Tourack comes in answer to a long-felt demand for a practical luggage-carrier—one that would carry anything from a lady's hand-bag to a full-grown trunk, and which was not an eyesore. It's going like the proverbial "house afire." And the Bethlehem Quickway Wrench-Sets—"A", "B", "C", C-Special and Mechanics' "D". Always fast-movers.

If you are not selling **ALL** the Bethlehem Betterments, selling lots of them, and making real money on the whole line, I want to hear from you—and hear at once. I'll appreciate it if you'll write me personally. Pick up a pen and a post-card and get a note off in the next mail.

*H. Schwab*  
President.

BETHLEHEM SPARK PLUG CO., INC.  
Bethlehem, Pa.

# for Motordom

**WAR DEPARTMENT****MAY**

(These sales subject to change)

May 1 — Q. M. SUPPLIES, San Antonio, Tex., Auction. For catalog write Q. M. S. O., Fort Sam Houston, San Antonio, Tex.

May 2 — AIR SERVICE SUPPLIES, San Antonio, Tex., Auction. For catalog write M. D. & S. Sect., A. S., Room 2624, Munitions Bldg., Washington, D. C.

May 4 — Q. M. SUPPLIES, St. Louis, Mo., Auction. For catalog write Q. M. S. O., General Intermediate Depot, 1819 W. Pershing Road, Chicago, Ill.

May 8 — Q. M. SUPPLIES, Jeffersonville, Ind., Auction. For catalog write Q. M. S. O., General Intermediate Depot, 1819 W. Pershing Road, Chicago, Ill.

May 10 — Q. M. SUPPLIES, Columbus, O., Auction. For catalog write Q. M. S. O., General Intermediate Depot, 1819 W. Pershing Road, Chicago, Ill.

May 11 — AIR SERVICE SUPPLIES, Rockwell Field, San Diego, Calif.,

**SEND FOR CATALOG****SELLING PROGRAM****MAY**

Auction. For catalog write M. D. & S. Section, A. S., Room 2624, Munitions Bldg., Washington, D. C.

May 15 — Q. M. SUPPLIES, San Francisco, Calif., Auction. For catalog write Q. M. S. O., Q. M. Intermediate Depot, Fort Mason, San Francisco, Calif.

May 17 — Q. M. SUPPLIES, Chicago, Ill., Auction. For catalog write Q. M. S. O., General Intermediate Depot, 1819 W. Pershing Road, Chicago, Ill.

May 18 — AIR SERVICE SUPPLIES, Mather Field, Sacramento, Calif., Auction. For catalog write M. D. & S. Section, A. S., Room 2624, Munitions Bldg., Washington, D. C.

May 24 — Q. M. SUPPLIES, Brooklyn, N. Y., Auction. For catalog write Q. M. S. O., General Intermediate Depot, 1st Ave. & 59th St., Brooklyn, N. Y.

The Government reserves the right to reject any or all bids.

**SEND FOR CATALOG**

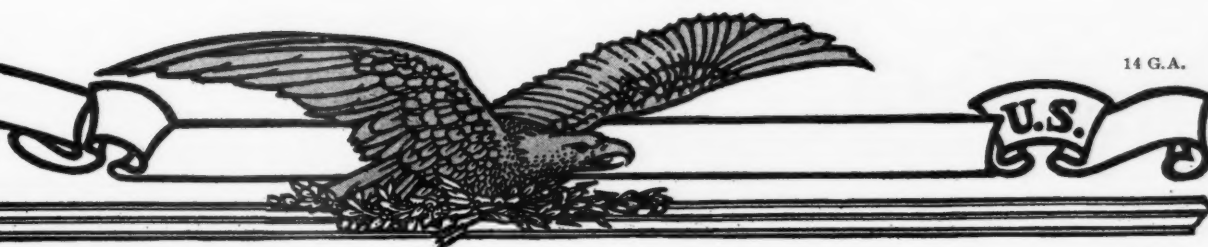
# Swing



# WAR

# DEPT





# *into the tradewinds*

*The War Department has charted a course of economical, sound jobbing*

War Department Surplus Property Sales offer commercial and industrial buyers a safe, easy and smooth-going course straight to the port of profits. During the four years this course has been charted farsighted and shrewd buyers have purchased over two billion dollars worth of the materials that were choking Army warehouses when our millions of soldiers were withdrawn from service.

As a result of War Department Surplus Property Sales revolutionary changes in business procedure have been made. Main street has taken on a new complexion; huge department stores have reorganized their departments; industry-at-large has discovered a way out of the dilemma of prohibitive prices and delayed deliveries of raw materials, equipment and general supplies. The transformation has been a revelation even to the originators of this 20th century jobbing enterprise.

There are millions of dollars worth more of this surplus available before the War Department abandons its jobbing activities. Nearly every piece of merchandise sold over the counter—every piece of equipment requisitioned daily by contractors, engineers and industrial plants can be duplicated from the surplus stocks to be sold in the next few months. And this large assortment is to be sold at prices you yourself are privileged to indicate—at Sealed Bid and Auction sales.

Glance at the panel and you will observe that some of these materials are available in early Auctions or Sealed Bid sales. It is your duty to yourself and your concern to ascertain just what is being offered in these sales. This accomplished the chances are ten to one you will want to participate. Write to Major J. L. Frink, Chief, Sales Promotion Section, Room 2515, Munitions Bldg., Washington, D. C., advising him of the sales that you think will interest you and your name will be placed on the mailing list for catalogs.



PARTMENT

# More Mileage at Less Fuel Cost



## For Any Car Any Size—Old or New

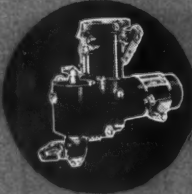
THE foremost item to consider in the upkeep of your car, is fuel consumption. Are you getting every ounce of energy from the gas you buy? There is a way—the New Stromberg Carburetor makes a slave of the gas—gets a “full days’ work” from every drop—makes a gallon go farther. It means actual economy through the saving of fuel.

THE make of your car—its age or condition cannot alter the fact that a substantial saving, a noticeable increase in efficiency of operation and additional power is evident where the Stromberg is installed.

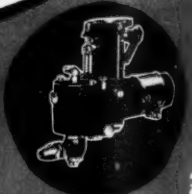
WRITE for literature. State name, year and model of your car.

**STROMBERG MOTOR DEVICES CO.**

64 East 25th Street, Dept. 427  
Chicago, Ill.

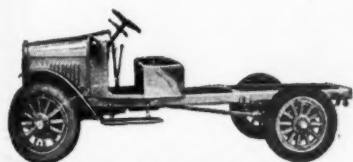


New **STROMBERG** Does it!  
CARBURETOR

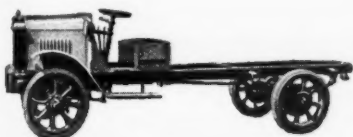




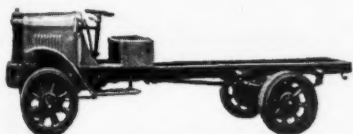
# The New BETHLEHEM Contract



KN "AIRLINE"  
\$1385



GN "FAST FREIGHT"  
\$2185



HN "HEAVY DUTY"  
\$2985

Complete protection for all Bethlehem Distributors and Dealers. A perpetual contract renewable automatically year after year on a reasonable, equitable basis. Bethlehem Distributors and Dealers are encouraged to be conservative in their requirements and will not be forced to accept unwanted trucks in excess of their need. Bethlehem discounts are larger than is customary and only bona fide, substantial dealers of the highest type will be appointed.

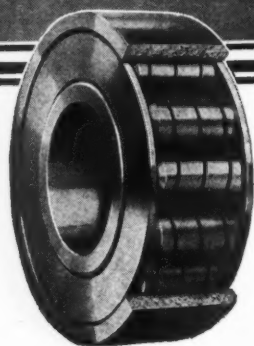
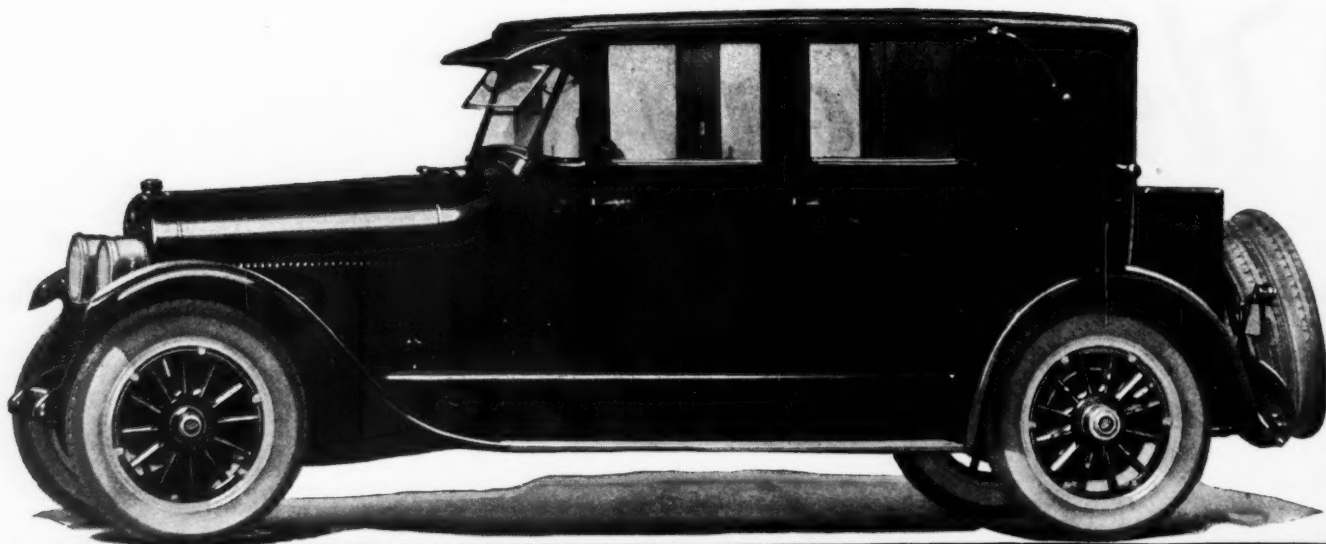
You are invited to look over the new Bethlehem contract without obligation. Write today for complete information about the new Bethlehem Trucks and the new Bethlehem Franchise.

THE NEW

**BETHLEHEM MOTORS CORPORATION**  
of NEW YORK

ALLENTOWN

PENNSYLVANIA



# HYATT

*Quiet*  
**Roller Bearings**

The high reputation enjoyed by the Lincoln is due largely to the exacting standards of materials and workmanship that characterize every step in the manufacture of this high-grade car.

Where such high standards of construction are demanded it is obvious that Hyatt roller bearings should be specified for important locations.

Hyatt roller bearings are used in the transmission and on the propeller shaft of the Lincoln. In the transmission they assure a simplified, noiseless unit that will give enduring satisfaction. On the propeller shaft Hyatt bearings help to steady this member and enhance riding qualities by relieving the rear springs of torque loads due to driving and braking.

#### HYATT ROLLER BEARING COMPANY

Newark      Detroit      Chicago      San Francisco

Worcester   Milwaukee   Huntington, W. Va.   Minneapolis   Philadelphia  
Cleveland      Pittsburgh      Buffalo      Indianapolis



*First to combine principles of  
cushioning and checking*

BUY **AJAX**  
**SHOCK ABSORBERS**  
*for Complete Shock Absorption*

**\$35<sup>00</sup>** A PAIR  
**\$40**—FAR WESTERN STATES

The Ajax does more than check the recoil. It cushions the impact, as well. Its double spring action is as gently sensitive to the slightest jounce as to the hardest jolt. It smoothly takes up the thrust, then eases your car down softly on the rebound. It works every time, all the time.

**IMPACT POSITION**  
(CUSHIONING)



The lower spring compresses, the upper spring expands, taking up the force of the blow.

**RECOIL POSITION**  
(CHECKING)

The lower spring expands, the upper spring compresses, setting up a strongly increasing check.



**SIDESWAY, AT ALL SPEEDS, IS ELIMINATED**  
Rich Baked Black Enameled Housing, Nickel Plated Cap

**SALES AGENTS—DEALERS**

You'll find the Ajax a fast-selling profit-maker. Its handsome appearance and medium price, alone, will make big sales.

Wire or write at once for sales proposition before your territory is taken.



For Semi- or Three-Quarter Elliptic Springs

**THE BREWER-TITCHENER CORPORATION**  
CORTLAND, N. Y.

*Bears the Brunt of the Bumps*



## Three Great Features that make Great Sales

You have noticed the growing favor for the Rose High Pressure Lubricating System.

The reason most often given by dealers and owners for this preference is the Rose Self-Filling feature. Self-Filling is appreciated in a lubricator just as it is in a fountain pen. It saves muss, bother and time. This is a leading selling point.

Quality, of course, is another big factor. The Rose is made to a high standard; of stout materials and fine machine work. Each gun is tested against leakage under one ton pressure with light oil before it leaves the factory.

Rose prices have no equal, quality considered. A popular article at popular price is always a good seller. It is the labor-saving equipment of our great tire pump factory that has made such prices and such discounts possible.

FRANK ROSE MFG. CO., HASTINGS, NEBR.

# ROSE

## HIGH PRESSURE LUBRICATING SYSTEM

**NOTE:** Your greatest prospect is the Ford owner. The Rose outfit for Fords, complete with Pressure Gun, Shackles, Tie Rods, Steering Bolts, etc., sells at \$9.80—a price well within the means of any Ford owner. The excellent results obtained by dealers who have gone after this market has proven it a great opportunity. Try it.





# MANLEY HI-SPEED JACK



At last there's a garage Jack that will slip under *any* and every kind of a car and really work no matter what the conditions may be.

It's quick and it's reliable—it's easy to operate and it's convenient to use. It's almighty powerful and it's trouble proof—and there's never been a car built yet that it won't slip under and lift—*every time*. It works at any angle and in any position, no matter how cramped you are for room—and it works *quickly*.

## Quick Acting

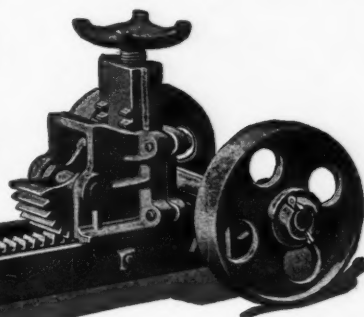
It takes but a second to slip this Jack into position and a slight push of your foot immediately elevates the post into position. One stroke on the handle—and the car is up—no time wasted here!

If there's a deep overhang to the body—no matter. The Manley Jack will reach eight feet under—we've never even seen a truck with more than an eight foot overhang—have you?

## For Crowded Places

If you're crowded for elbow room—a few short, easy strokes instead of one long one—and the car is up. *You can operate the Manley Jack from any one of six different leverage positions of the handle.*

To lower the car you pull on the lever under the handle—it's right at your finger tips—one stroke and the car is down. No time wasted—no fuss—no bother—no effort—no cussin'—perfect Jack performance and real economy.



*Note the underslung construction and big husky rear wheels that take the weight. The front wheels swivel.*

## Good for a Lifetime

The Manley Hi-Speed Jack has no delicate springs, dogs, or toggles. There's nothing to get out of order—no part can fail to work. The entire action is *positive*. One gear operates another—compounding the leverage—that's all. No possible chance for trouble. You'll never have to replace this Jack—it's good for a lifetime of service.

## Write for the Details

Manley shop equipment is handled by nearly all good jobbers. Ask yours.

Every garage man knows what a hard job it is to unload cars from the freight car. With the six distinct operating positions it is possible to work easily in such cramped conditions.

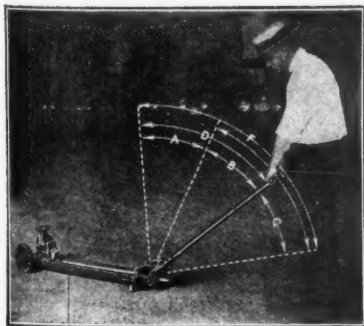
MANLEY MFG. CO., YORK, PA.

*"The Best Equipped Shop Gets the Business" with*

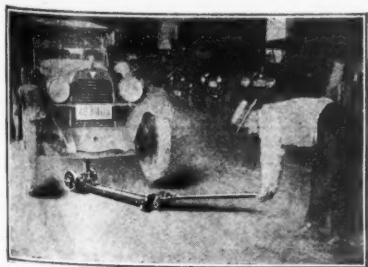
# Manley

## Garage Equipment

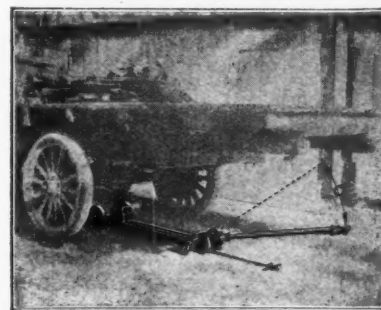
MADE IN YORK, PA.



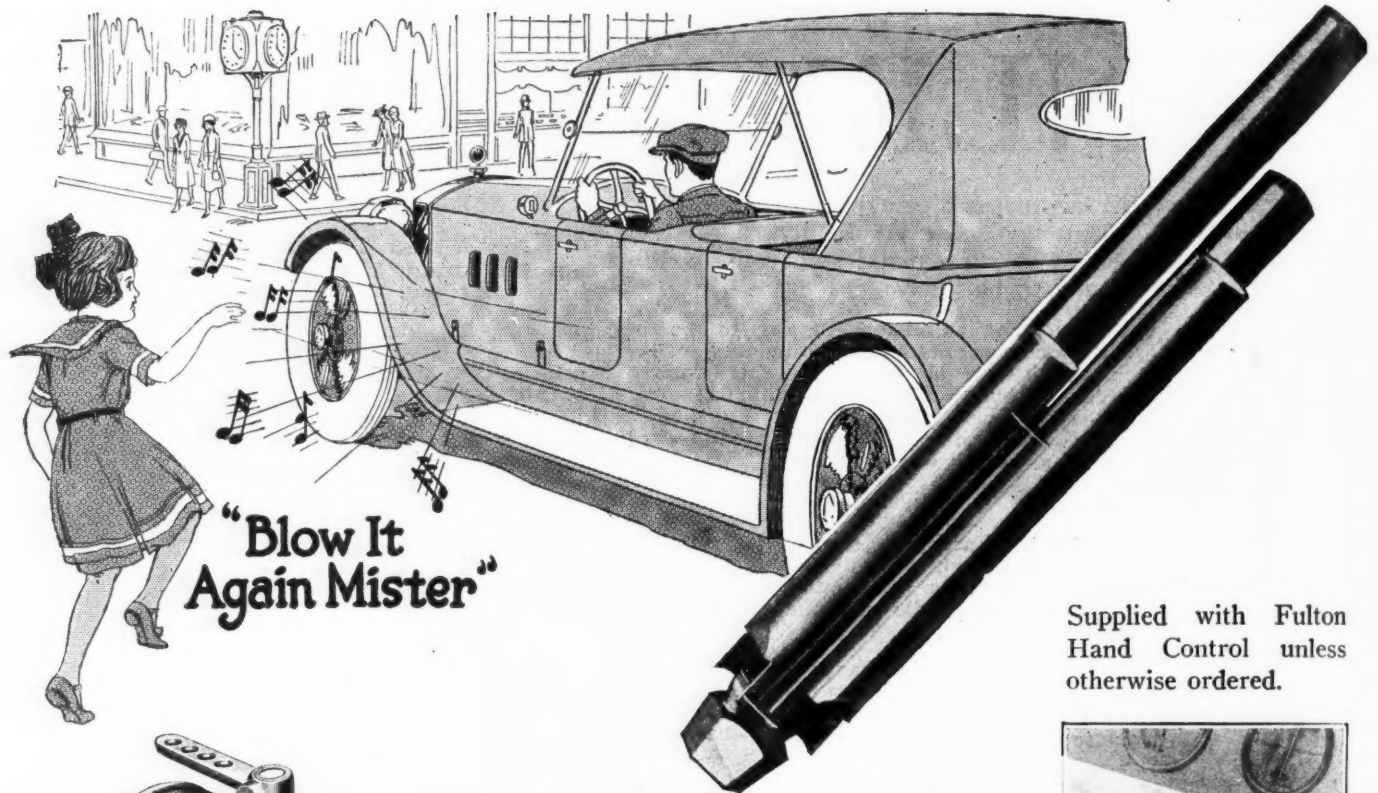
*Six distinct operating positions of handle for lifting or lowering cars.*



*One stroke and the car is up or three short strokes to suit conditions*



*Operates under overhanging bodies because of its six operating positions.*



**"Blow It  
Again Mister"**



### Dealers

The Aermore makes money and friends for dealers. Demonstration stand given free to dealers ordering 10 or more Aermores, one or assorted sizes. Write for attractive dealer proposition.

## A Reliable Signal Helps Avoid Accidents

Carelessness is not always the cause of accidents—it's maybe caused by an unreliable signal or one that is so harsh and disagreeable that it causes confusion.

## The AERMORE Exhaust Horn

The Aermore is called "the signal with a smile" yet it may be heard for a mile or more. It is not affected by weakened batteries or defective wiring. It operates by exhaust gas—never fails. Easily attached, lasts a lifetime.

Supplied with Fulton  
Hand Control unless  
otherwise ordered.



### Made in Four Sizes

- No. 00 22 in. Aermore Outfit Complete, "Motor Bus Special" .....\$14.00
- No. 0 17 in. Aermore Outfit Complete, for large autos, trucks .....\$12.00
- No. 1 15 in. Aermore Outfit Complete, for medium cars .....\$10.00
- Ford Special Aermore Outfit with hand Control .....\$7.00

Give outside diameter of exhaust pipe. Ask your Jobber or write us.

## The Fulton Shellerite Steering Wheel

There's a new delight and satisfaction in having a car equipped with this splendid wheel. It is quick turnover equipment made of hard rubber, will not crack or fade. Has beaded top, corrugated with outside hand grip. Polished aluminum spider inserted in rim. They dress up a car and make driving more comfortable. Standard equipment on a number of high-priced cars. Diameter of wheel 17 inches.

For Chevrolet, Dodge, Maxwell, Star, Overland Cars .....\$6.00  
For Ford Cars..... 5.50

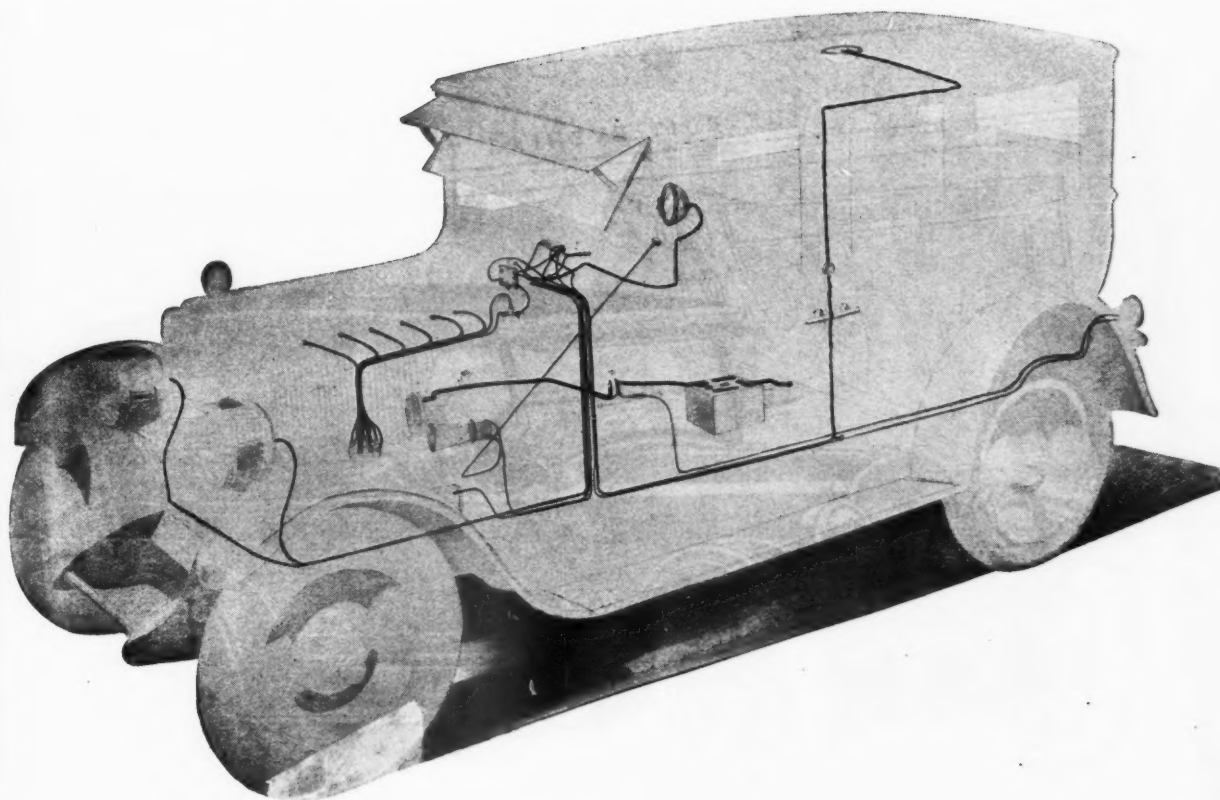
*Ask your Jobber or write us*



**THE FULTON COMPANY**

Dept. 15-F  
75th and National Aves.

**Milwaukee, Wis.**



## More Than 300 Jobbers Contract to Sell Packard Cables Exclusively

Unusual distribution of an automotive product is convincing evidence of **demand created**—demand trailing up through the arteries of trade from the ultimate consumer.

Only a great dealer demand could build up 300 exclusive jobbing connections.

Thousands of automotive dealers have reordered Packard Cable for more than 20 years, for starting, lighting and ignition cable replacement.

Packard Cable is *a product of good repute*, forcefully and intelligently merchandised along clean cut lines which take into consideration the best interests of the trade.

Packard Cable is completely catalogued in every issue of the Automobile Trade Directory and the Chilton Automobile Directory. Make a list of your requirements for the next call of your jobber's salesman.

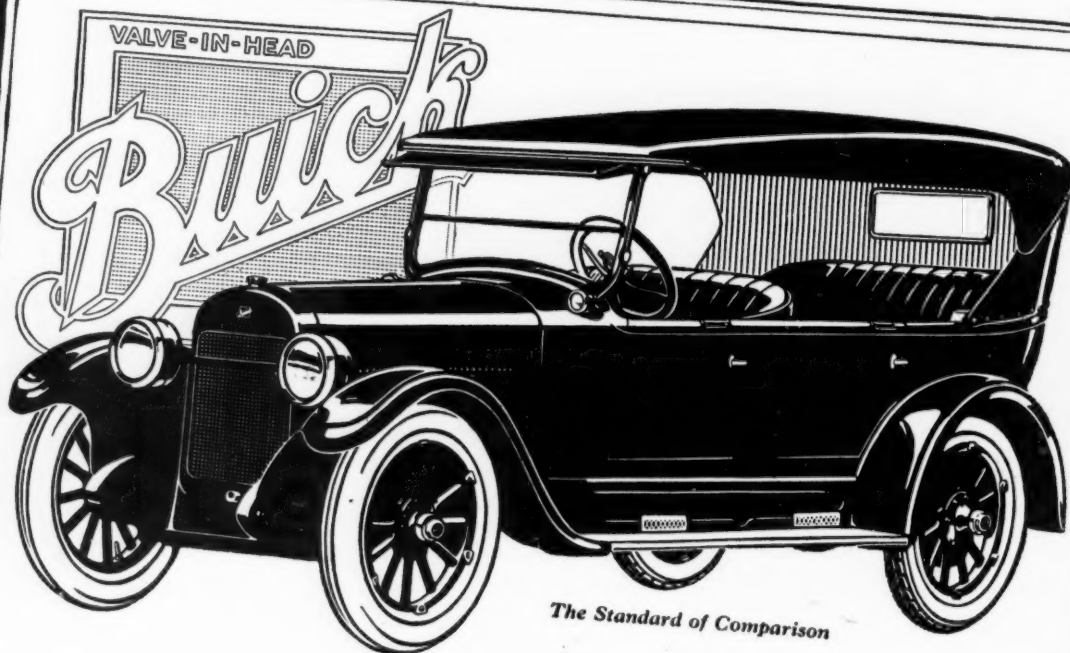
*The Packard Electric Company*

Warren, Ohio

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DETROIT EVENING TIMES



## Once A Buick Owner— Only Buick Satisfies

In every community there are a number of instances where once a Buick has been purchased by one member of a family, others of the same intimate group have become Buick owners.

Buick dependable performance, luxurious comfort and the fact that there is a type of Buick to fit every motoring need, leads to the selection of Buick family car.

Significant  
new B

Fours	
2 Passenger Roadster	\$ 865
5 Passenger Touring	885
3 Passenger Coupe	1175
5 Passenger Sedan	1395
5 Passenger Touring Sedan	1325
Sport Roadster	1025

Sixes	
2 Passenger Roadster	\$1175
5 Passenger Touring	1195
5 Passenger Touring Sedan	1935
5 Passenger Sedan	1985
4 Passenger Coupe	1895
7 Passenger Touring	1435
7 Passenger Sedan	2195
Sport Roadster	1625
Sport Touring	1675

Prices f. o. b. Buick factories; government tax to be added. Ask about the G. M. A. C. Purchase Plan, which provides for Deferred Payments

## One Buick Sale Builds Others

Every community has families in which several members are Buick owners. The initial sale has brought the others to the local Buick dealer. Why not have your name on file?

**BUICK MOTOR COMPANY, FLINT, MICHIGAN**  
Division of General Motors Corporation

Pioneer Builders of  
Valve-in-Head Motor Cars

Branches in All  
Principal Cities



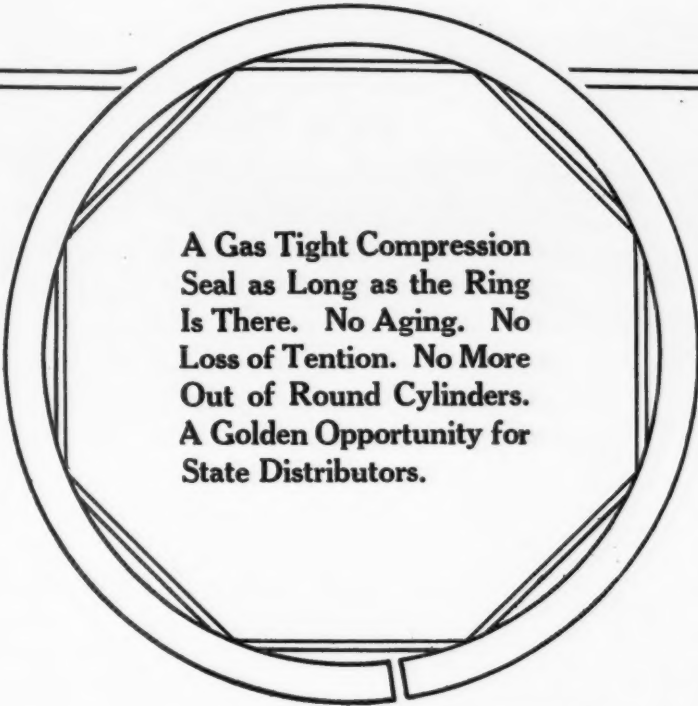
# Perfect Compression At Last!

A new and revolutionary advance in piston ring design that puts an end to oil pumping, uneven cylinder wear, compression leakage, and the many engine troubles due to unequal ring tension.

Think of a piston ring with all the advantages of cast iron and all the long life and rugged endurance of tempered steel! Think of a piston ring that exerts equal tension ALL AROUND THE CYLINDER WALL so that not even the tiniest ray of light can get past!

Think of a piston ring that banishes oil pumping and out-of-round cylinders PERMANENTLY—curing forever the many motor ills that occur where the common type of ring is used!

The Osborne Equi-Tension Piston Ring introduces a new principle in ring construction, securing all-around contact against the cylinder wall by the equalized pressure of a piano wire insert. The great advantages of this design are instantly apparent: The ring, exerting no pressure itself, has no tension to lose, and therefore provides a perfect seal as long as it is kept on the piston. The eight points of the piano wire insert distribute the contact equally all around the



**A Gas Tight Compression Seal as Long as the Ring Is There. No Aging. No Loss of Tension. No More Out of Round Cylinders. A Golden Opportunity for State Distributors.**

cylinder — instead of exerting eighty per cent of the pressure at the base of the ring and away from the cut, as in the case of rings depending on their own tension for contact.

Thus the Osborne Equi-Tension Piston Ring attains the PERFECT

COMPRESSION that automotive engineers have so long sought, and with its installation cylinder walls can never more be worn out of round.

A ring that brings permanent relief from the most aggravating of motor troubles is destined to have a sensational future—and some live wire distributors are going to share that future with it. You'll pronounce our proposition a winner as soon as you read the details. Tear off the coupon, if you want to clinch the assignment for your territory, and mail it at once.

## THE OSBORNE PISTON RING CO.

5005 EUCLID AVE., CLEVELAND, OHIO

*The* OSBORNE  
*Equi-Tension*  
PISTON RING

ECLESTON BROS.  
Distributors for Washington  
1420 Broadway  
Seattle, Wash.

**The Osborne Piston Ring Company,**  
Cleveland, Ohio

Tell me more about that wonderful new piston ring, and let me have the details of your distributing plan embodying exclusive territorial rights. I assume no obligations whatever in making this request.

Name.....

Address.....

Makes the Ford steer like a big car

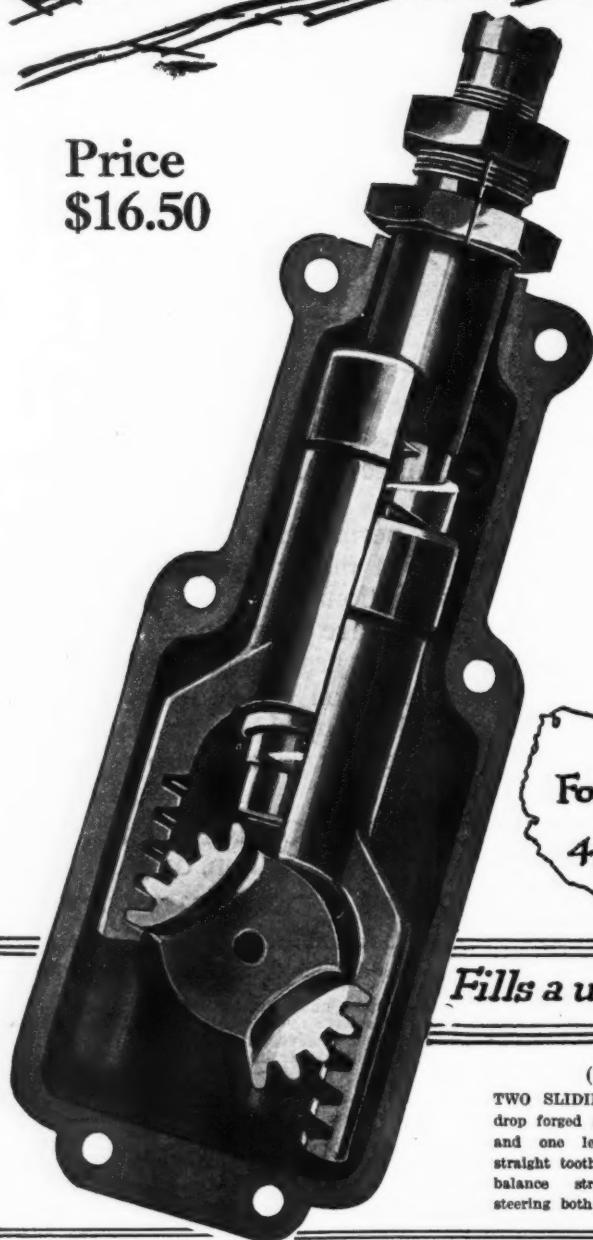


# C.P.C.

Balanced Pressure  
**STEERING  
GEAR**

**FOR FORDS**

Price  
\$16.50



## Here's "Fine-Car" Comfort!

MOTORISTS speak of the "feel" of a Fine Car. What they mean is the *absence* of feel—the complete ease of handling—the perfect freedom of action—the effortless control that makes driving such a pleasure.

And the Ford has it too, now, where the C. P. C. *Balanced Pressure* Steering Gear is used. No more shocks, jolting and jumping. No more cramping of the hands. No more driving fatigue. No shocks can reach the wheel through the C. P. C. Gear. No straining is needed to hold the car to its course. The wheel is controlled by the slightest pressure of the fingers. It brings big car comfort to Ford driving.

All Ford owners need it—and *want* it. All can afford its low price. The installation is quickly done—no skilled mechanic needed. The profit is large. Quick sales are sure. Good business all year 'round. Write today for details of dealer plan.

Ford Registration

- 1922

4,800,000 - Cars  
750,000 - Trucks

**RECORDING DEVICES  
COMPANY**

12 Norwood Avenue  
Dayton, Ohio

*Fills a universal need for the universal car*

(1)

TWO SLIDING HEADS of drop forged steel, one right and one left, each with straight tooth rack, serve to balance stresses, making steering both safe and easy.

(2)

TWO SPIRAL NUTS, hardened and ground, turning with main shaft, to which they are keyed by splines, cause the sliding heads to travel in opposite directions, up and down.

(3)

THE TRUNNION SHAFT teeth engage the racks of the sliding heads, under the push and pull of which the trunnion shaft turns. Four teeth in contact, two in each rack, give nearly three times the contact afforded by the worm and wheel type of gear.



# Ask us these Pointed Questions

Show this page to your stenographer and tell her to write us, asking these vitally important questions, adding others if you desire.



## The Westcott Line

Standard Touring .....	\$1690
Sport Touring .....	1890
Closure .....	1795
Sport Closure .....	1995
Sport Brougham .....	2490
(Including Trunk)	
Sport Sedan .....	2490

These questions pertain to the basic facts which govern the success or failure which the dealer will have with any motor car proposition today.



THE WESTCOTT MOTOR CAR CO.,  
SPRINGFIELD, OHIO.

Gentlemen:—

Please answer the following questions as concisely and definitely as possible.

1. What are you doing to minimize your dealers' used car hazard and protect them against loss through trade-ins?
2. Do you expect your dealers to spend their profits on conditioning cars for service or does the factory protect them against this loss?
3. Do you see to it that your dealers keep their profits or must they diminish these profits considerably by free service work?
4. Prove to me that the Westcott gives the sort of reliable, durable service which builds a steadily growing volume of repeat sales.
5. Prove to me that there is a persistent demand for the Westcott in my territory—that the range of prices and models meets the present-day demand—that there is a widespread confidence in the Westcott car and the company.
6. Show me the record of the Westcott Company covering a period of years and the history of typical Westcott dealers handling the car in territories similar to mine.

(Name).....

(Address).....

# WESTCOTT

*The Car with a Longer Life*



Samsons  
Don't  
Skid

# What is the measure of tire service?

**Mileage?** —then Samson Heavy Duty Supersize Cords are first choice because they deliver a real excess of mileage even under the most trying conditions.

**Safety?** —again Samson is the one tire that has the unqualified endorsement of bus line operators on the Pacific Coast because of the Samson Non-Skid assurance of Safety.

**Price?** —prominent Public Transportation Lines, the keenest judges of value, have shown their appreciation of Samson Value by standardizing 100 per cent on Samsons.

*Further facts are yours for  
the asking—write for them*

Samson Dealerships are most profitable—investigate

**Samson Tire &  
Rubber Corporation**

Manufacturers

410 West Pico Street  
Los Angeles, California

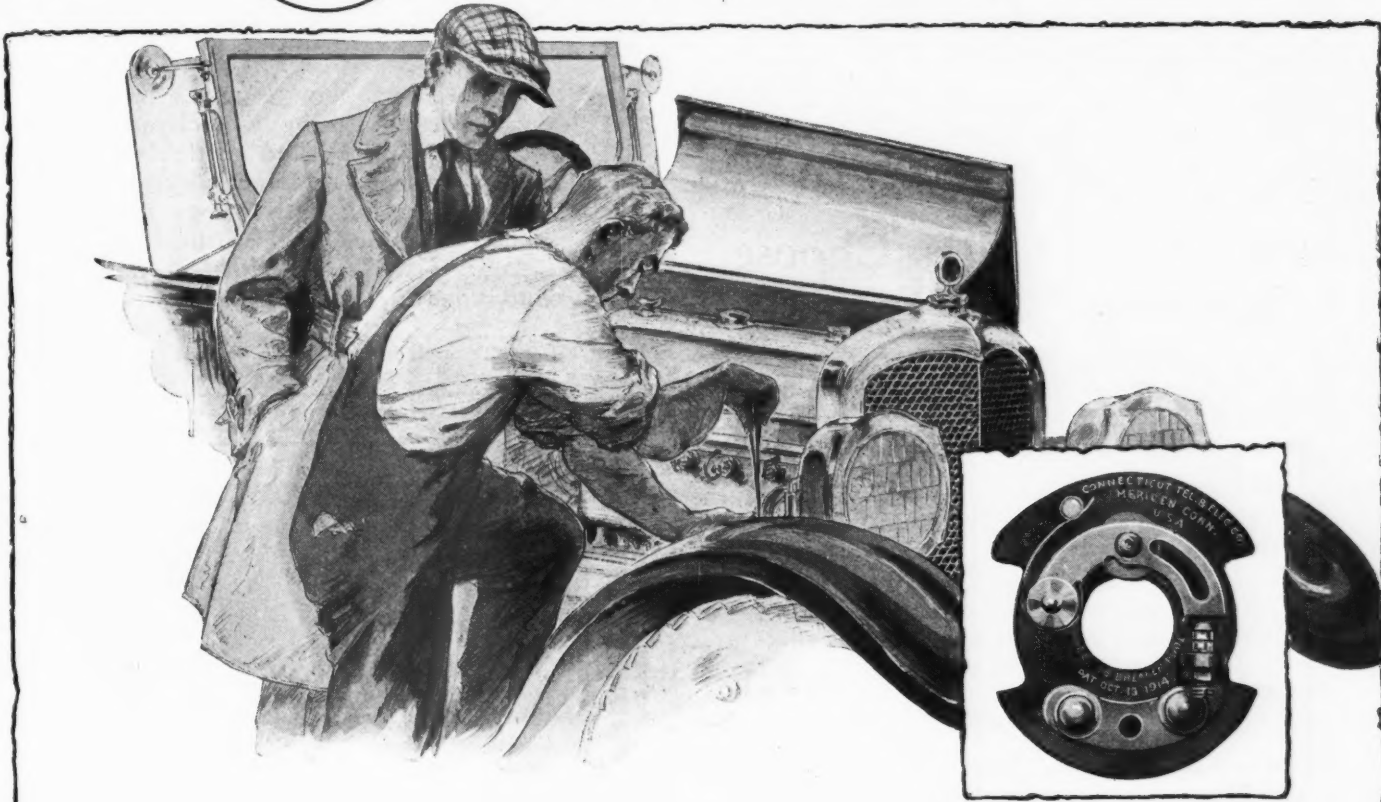


# SAMSON SUPER SIZE CORDS

# CONNECTICUT



## IGNITION



Genuine CONNECTICUT points cannot be purchased other than in complete breaker plate assembly (shown here).

### *A Five-Minute Job*

A motorist drives up to your shop to have contact points of his igniter renewed.

With any car CONNECTICUT equipped, and providing genuine CONNECTICUT parts are used, this is only a five minute job.

Knowing that contact points, which are always subject to electrical wear, will require occasional replacement, and—

Realizing that this very contingency is likely to happen just at a time when the motorist can least afford to forego the use of his car—

Our engineers designed the igniter mechanism of the CONNECTICUT system so that it would

be quicker, cheaper, and more satisfactory in every way to substitute a new breaker mechanism than to attempt to renew the contact points alone.

From an engineering standpoint, this assures a genuine factory built, factory tested, and factory guaranteed replacement.

From a service standpoint, it not only eliminates the need of expensive tools, jigs, and testing apparatus, but it insures promptness, economy, and satisfaction.

From a car owner's standpoint, it saves time and trouble.

Four or six cylinder igniter breaker plates, \$3.00

Eight cylinder igniter breaker plates, \$3.50

*Write for booklet of instructions*

AUTOMOTIVE IGNITION DIVISION



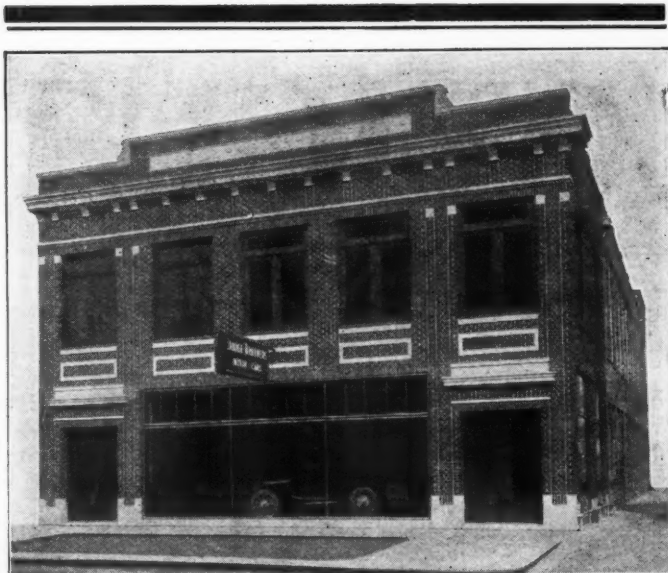
**CONNECTICUT**  
MERIDEN

**TELEPHONE  
& ELECTRIC**

**COMPANY**  
CONNECTICUT







## Motor Car Dealers Choose Kawneer Store Fronts

Count the number of Kawneer Solid Copper Store Fronts along "Motor Row" in any big city. You will find that they predominate on sales-rooms of the better class.

Could there be more convincing proof that Kawneer Fronts actually build sales for the motor car retailer? Can any dealer fail to recognize their true value in view of this evidence?

The favor which automobile men have long shown Kawneer Fronts is based primarily upon the effective displays they make possible. A beautiful car is never seen to better advantage than when it is properly set off behind a Kawneer Front. The attraction such a display has for the prospective buyer will show up prominently in your year's sales. The experience of thousands of successful dealers verifies this statement.

### Book of Designs Free

The latest Kawneer Book of Designs shows a type of Kawneer Front that will bring added profits to you every year. The coupon below, attached to your letterhead, brings you a copy without obligation.

**Kawneer**  
SOLID COPPER  
STORE FRONTS

Clip and Mail Today!

The Kawneer Company,  
1319 Front Street, Niles, Michigan.

Gentlemen:—Please mail me a copy of your latest Book of Designs.

Name \_\_\_\_\_

Address \_\_\_\_\_

## Spool Fits the Hand

As shown below, the one pound spool of Kester Acid-Core Wire Solder fits the hand comfortably—likewise the one pound coil that comes in a carton. Both of these sizes are "handy" for the tool kit and for carrying from job to job. The far-sighted garage owner carries also the five and ten pound spools which are ideal for bench and routine work, and are a bit more economical.

With Kester "one requires only heat" because it supplies a scientific flux in the tiny pockets inside a virgin tin and lead solder. This eliminates bothering with messy acid pots, swabs, sticks and brushes, and permits better work with less time and material.

"Sample for Test Upon Request"

Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools



Manufacturers

**CHICAGO SOLDER COMPANY**

4203 Wrightwood Avenue, Chicago

Direct Factory Representatives:

THE FAUCETTE HUSTON CO.  
Chattanooga, Tenn.

LOUIS J. ZIESEL CO.  
216 Market St.  
San Francisco, Cal.

DAVIES-ELY CO.  
66 W. Broadway  
New York City

**KESTER**  
*Acid Core* WIRE SOLDER



*Requires Only Heat*

# Motor Transport

A magazine for the Fleet Owner, furnishing reliable and accurate news, information and advice on how to economically operate fleets of motor vehicles.

Contains statistics, diagrams and special articles, treating of successful truck operation in all the different trades and industries—Department Stores, Contractors, Shoes, Coal, Wood, Lumber, Dry Goods, Oil Delivery Companies, Bus Lines, Telephone Companies, etc., etc.

Read by leading Fleet Owners throughout the country—men, firms and corporations who own and operate from 5 or 10 up to hundreds of motor vehicles. One subscriber, for instance, owns and operates upwards of 1800 Trucks and maintains 30 Garages and Service Stations. MOTOR TRANSPORT is the only publication in this particular field and is a real necessity to Traffic Managers, Garage Superintendents and others who look after the care and operation of fleets of motor cars, trucks, busses, etc.

MOTOR TRANSPORT is published twice a month, on the first and fifteenth. The subscription price is \$2.00 a year (2.50 west of the Mississippi). Sample copies will be sent upon request.

## MOTOR TRANSPORT

239 West 39th St.  
New York, N. Y.



**Just  
Published**

Send  
for  
a Free  
Copy

You will find this booklet not only interesting to read but full of valuable information you will want to keep on file. It has been prepared at considerable trouble and expense and is, we believe, the most complete work ever brought out on the subject of silent timing gears.

The publication of this booklet is a continuation of our policy of rendering a type of service that has never been equalled in the timing gear field. Send for a copy. It's free.

*Genuine*  
**D & B**

The original  
**SILENT  
TIMING GEARS**

MANUFACTURED BY



2333 Michigan Blvd. Incorporated Chicago, Ill.



Over Half a  
Million D & B  
Silent Timing Gears  
Now In Use

Dalton & Balch, Inc.,  
2333 S. Michigan Ave., Chicago.

Send me a copy of your booklet as advertised. I understand it will be sent to me free and postpaid.

Name.....

Address.....

City..... State.....

Jobber's name.....

# Service

*has been the vital  
factor in establishing  
Usaco prestige*



S. B. 23  
Twin Cylinder  
Single Stage  
Compressor

An air compressor, to fully serve its purpose, must be instant in response, adequate to meet maximum requirements and absolutely dependable in operation.

To design a compressor that will maintain such service for a short time is an easy matter—to produce one that will do so day after day, for years to come, is a very different proposition.

In the face of keen competition, Usaco air compressors have maintained unapproached leadership; the name Usaco has become established as a word for quality in every city and hamlet in the country, and many of the most discriminating companies of national and international prominence have adopted these compressors as standard equipment.

Underlying this success has been the exceptional "Service" rendered—the inevitable result of inbuilt quality in every detail, highest standards of workmanship, fully automatic operation and specialized effort to build the world's best air compressor.

And Usaco quality will be yours whether you want a simple unit or a compressor of large capacity, two-stage or single-stage design, air or water cooled. The new Usaco "Perfect Balance" Service Tower is also a "knock-out"—made in every respect, up to the high Usaco standard of quality.

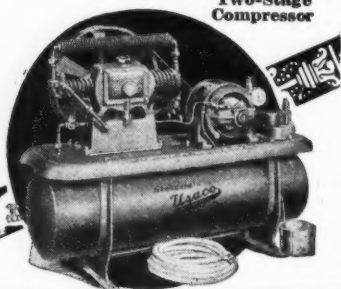


Usaco  
Perfect  
Balance  
Service  
Tower

*Get the literature  
and all the facts.*

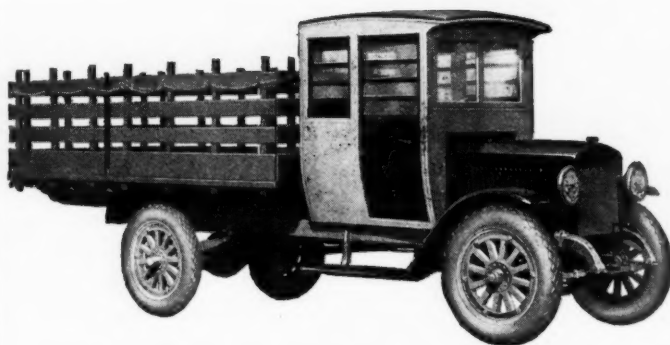
## The United States Air Compressor Co.

5304 Harvard Ave.,  
Cleveland, O.



Usaco  
Standard De Luxe  
Two-Stage  
Compressor

Two Stage **Usaco** Single Stage  
AIR COMPRESSORS



## A Crackerjack One-Ton Model!

Today the one-ton truck is one of the country's best sellers. It's in demand everywhere.

Here's a crackerjack one tonner—a wonderful piece of merchandise.

This powerful, well-balanced, rugged one ton design will be a big money maker for money-making dealers.

Buda motor

Brown-Lipe clutch  
and transmission

Timken axles

Modine-Spirex  
radiator

132-inch wheel base

33x5 Pneumatic  
cord truck tires

In production now. Prompt delivery. For big dealers and small dealers—for big towns or small towns—everybody everywhere can make money selling this remarkable one-ton job.

*May we hear from you at once—today?*

**Duplex Truck Company**

Lansing

Michigan

**DUPLEX**  
BUILT  
FOR BUSINESS



—the weatherproof battery that sheds water like a duck's back!



## The Dealer's Delight!

That's what these 3 sizes of Columbia Steel Case "Hot Shot" ought to be called!

For they cost no more than fiber case batteries to trade and consumer, work better and longer, and consumer demand is universal.

### 3 Sizes Now!

No. 1461—4 Cellpower—6 Volts  
4 cells in a row (fits under the Ford front seat)

No. 1562—5 Cellpower—7½ Volts  
5 cells in 2 rows

No. 1662—6 Cellpower—9 Volts  
6 cells in 2 rows

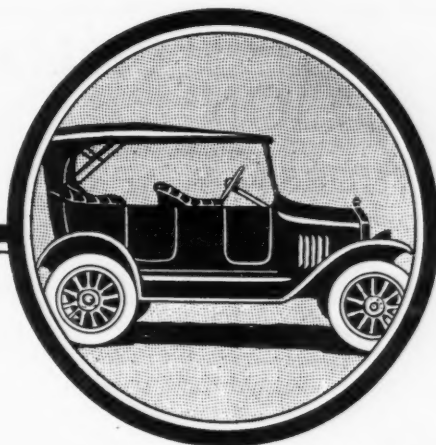
Quality makes Columbia the ignition battery supreme! Stationary gas engines wherever and for whatever used, tractors, and non-self-starting Fords—all these form a ready-made market. We not only guide this market to the dealer's door with a forceful stream of advertising, but we help him sell when it gets there. We back up Columbia Quality with commensurate Cooperative Sales Effort, Store and Window Display, and Service.

*Your jobber is with you on this*

NATIONAL CARBON COMPANY, Inc.  
Long Island City, N. Y.

Atlanta Chicago Cleveland Kansas City San Francisco

**Columbia**  
**Dry Batteries**  
—they last longer



## For the USED Ford

The Ford Faithful Oiling System means NEW LIFE for old Fords. Power and Pep is renewed, and the old bus runs smoother than it has for many a day.

With the Ford Faithful installed there is no more clogged oil lines, no more resultant burnt out bearings and no more scored cylinders. No more overheating and constant repair bills.

A Ford Faithful will not overhaul your Motor but it will increase its efficiency and life 50%, as well as eliminate practically all trouble, worry and expense. It will make your motor run smoother and quieter, and eliminate chatter and frequent adjusting of your brake bands. It's worth \$100.00 but you can buy the

### Ford Faithful Oiling System

Complete

**\$5.75**

Dealers there are hundreds of old Fords as well as new ones in your vicinity that ought to have Ford Faithful Oilers put on. In supplying them, you not only make money but also satisfied customers to whom you have done a good turn.

*Write factory for special quantity prices.*

**W. O. Thompson Mfg. Co.**

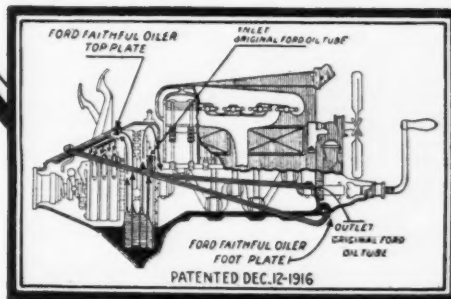
330 Mountain View St.

PASADENA

CALIFORNIA

*Ford Faithful patents are being upheld. Infringers will be prosecuted to the full extent of the law.*

**FORD FAITHFUL**  
OILING SYSTEM



# TRUSTEE'S SALE AUCTION AUCTION

By order of the U. S. District Court for the Northern District of Illinois we will on  
**THURSDAY, APRIL 26th, 1923, Commencing at 10:30 A. M. at**  
**61st and ARCHER AVE., ARGO, ILLINOIS**  
 sell at public auction all assets belonging to the estate of the

## ELGIN MOTOR CAR CORPORATION BANKRUPT

We are offering for sale the real estate subject to liens of approximately \$140,000—and also the Trustee's right, title and interest in the Good Will of the defunct concern.

The following is a partial list of Supplies, Parts and Accessories, in large quantities of each:

Pumps, Oil and Gas Gauges and Ammeters, Jacks, Wind Shields, Van Sicklen Speedometers, Instrument Boards, Lighting Cable, Willard Batteries, Robe and Foot Rails, Wheel and Rim Wrenches, E. A. Electric Horns, Running and Floor Boards, Tool Kits, Gilliam, Timken and S. R. B. Bearings, Oil Cans, Tail Lights, Oldfield and Firestone Tires and Tubes, 250 New Upholstered Touring and Roadster Bodies.

Firestone Wood Wheels and Rims, Columbia Axle Sets, 650 Propeller Shafts and Universal Joints, Radiators, Transmissions, Frames, Carriers, Fans, Brake Lining, Mufflers, etc.

An immense stock of Bumpers, "L's," "T's," Strainers, Arms, Fittings, Manila and Sisal Rope, Nails, Tacks, etc.

100 Tons Sheet, Flat, Cold Rolled, Machine, Galvanized Steel and Pipe. 100 Tons Steel and Iron Casting.

\$25,000 worth of Standard Screws, Washers, Bolts, Clamps, Pins, and Rivets of all makes and sizes.

An immense stock of Bow Covering, Drill, Buckrum, Pantasote, Muleskin, Webbing, Thread, Celluloid, Enamel, Varnish, Paints, Grease, Oils, Soaps, etc.

An enormous stock of Auto Accessories, such as Levers, Hose, Covers, Switches, Plates, Carpet, Cushions, Covers, Clutch and Transmission Parts, Pistons, Connecting Rods, Housings, Bushings and hundreds of others too numerous to mention.

We are also selling all of the Machinery, Shop Equipment, Fixtures, Motors, Sewing Machines, Tools, etc.

*Descriptive circulars are being issued and can be had at office of undersigned auctioneers.*

The above will be offered in lots suitable to the trade for cash. A deposit of 25 per cent will be required from each purchaser. Positively no checks accepted unless certified.

Fred E. Hummel, Trustee

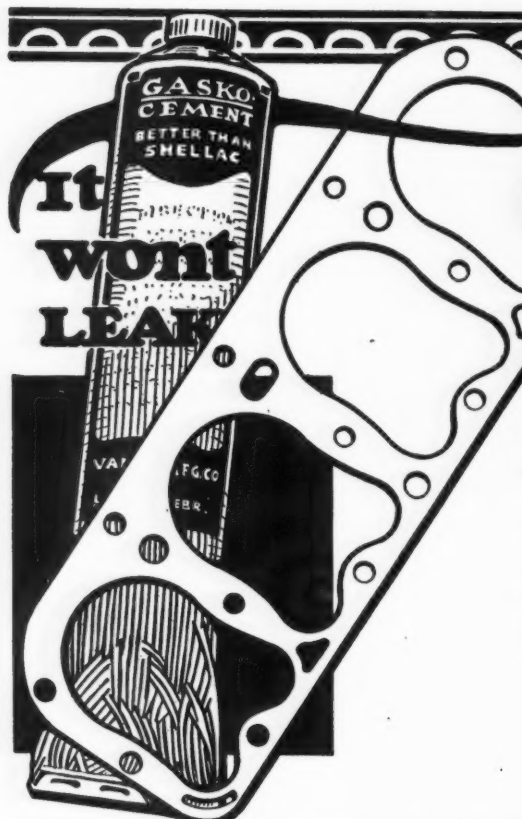
Herbert A. Lindahl, Attorney for Trustee

**SAMUEL L. WINTERNITZ & CO. and MICHAEL TAUBER & CO.**  
 AUCTIONEERS

407 First National Bank Bldg.

317 South Market St.

CHICAGO, ILL.



**BETTER THAN SHELLAC**

# Gasko-Cement

*always elastic ~ never brittle*

The merits of GASKO can be understood and proven best by test—that's all we ask you to do—TRY IT—we know you will want more of it. Send for our 25c trial tube—TODAY—25c in stamps will do—

Ask Your Jobber or Write Us.

**GET ACQUAINTED WITH GASKO**

**VAN SICKLE MFG. CO. LINCOLN, NEB**

# MAIL THIS COUPON TODAY

**STOP**

**GO**

→

←

*Heckman*  
AUTO SIGNAL  
all but talks

By return mail we'll send you full details of a truly remarkable merchandising proposition on a really practical rear-end automobile signal—

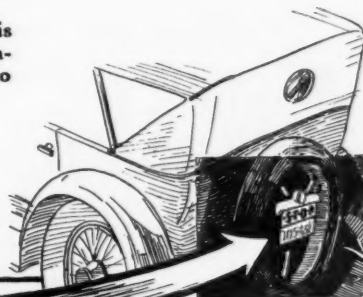
## The HECKMAN Auto Signal "All But Talks"

This device, built upon an entirely new principle—is surprisingly simple in construction, virtually automatic in operation, staunchly built, and absolutely dependable. Always gives a distinct, positive warning of the direction of a proposed turn, to the car in the rear—and does so at any desired distance before a corner is reached. Endorsed by leading auto clubs, Chambers of Commerce, Safety Councils, etc.

The need of a signal such as the HECKMAN is recognized everywhere; a demonstration almost invariably means a sale; sales mean liberal profits to our dealers. It is worth your while to investigate our agency proposition and the "money-back" guarantee. Sign the coupon and mail today—it costs you nothing.

The Heckman Signal Company  
117 Bowen Street St. Louis, Mo.

City \_\_\_\_\_ Street and No. \_\_\_\_\_ Firm Name \_\_\_\_\_  
Please send us descriptive literature and full details of the HECKMAN Signal agency proposition.  
M. A. 4-19  
The Heckman Signal Co.  
117 Bowen St.  
St. Louis, Mo.  
State \_\_\_\_\_  
LINE—TEAR OFF AND MAIL TODAY



G. & K. complete line of Fan Belting and Clutch Leathers. Well displayed, easy to handle, rapid turnover. Ask your jobber.

The Graton & Knight  
Manufacturing Co.

Automotive Division  
Worcester, Massachusetts



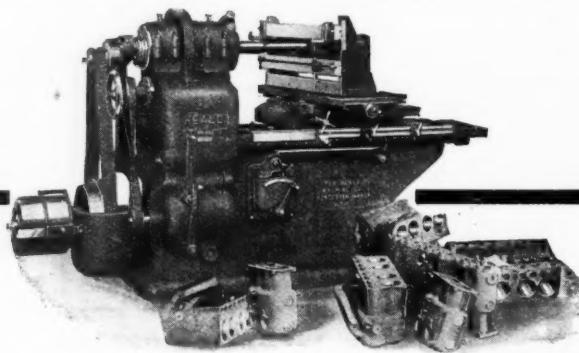
# Repairmen and Motor Owners Unanimously for the HEALD

THE REPAIRMEN choose the Heald for its economy in producing the highest grade of work. The Heald Universal Jig permits quick set-ups and accurate location of the cylinder bloc regardless of size or type. Simplicity of control eliminates lost motion and accurately graduated dials supplant guesswork. Every factor for cutting time from floor to floor is incorporated in the design and the minutes saved on every bloc show in dollars in the day's profits.

THE CAR OWNER demands Heald regrinding because of its efficiency and economy. A Heald-ground cylinder is as perfect as mechanical means can make it. 90% of all motor manufacturers finish their cylinders by grinding and use Heald machines exclusively. Naturally the owners will want the same grade of finish when regrinding in order to maintain the high standard of their power plant.

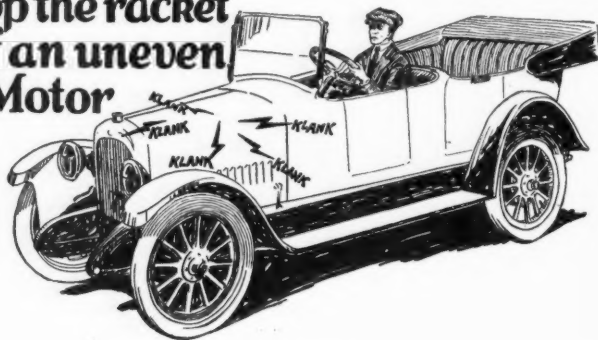
*If you are considering this work, visit several regrinding shops, get in touch with the manufacturers themselves, and finally question various motor owners as to what equipment they advise to handle this work so as to bring you ultimate success. Let us send you convincing literature or even give you a personal call. No obligation. Glad to do it.*

**The Heald  
Machine Co.**



**61 New Bond St.  
Worcester, Mass.**

**Stop the racket  
of an uneven  
Motor**



If there is to be any noise in a motor car, let it be harmonious. The soft, even purring of an engine is music to the driver's ears. But if one spark plug fails, the unrhythmic chugging grates on the system of the driver as well as on the car.

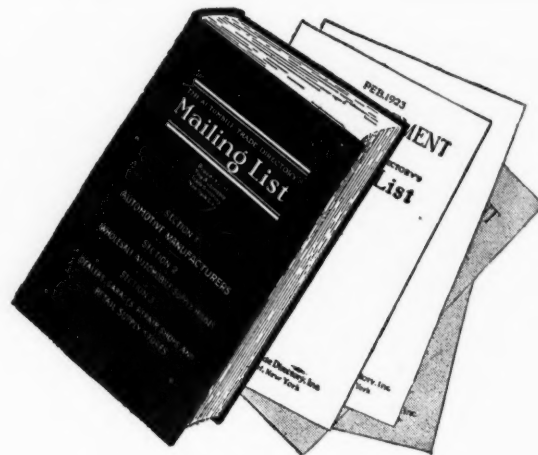
Profit by those who know. Buy spark plugs with the "775" insulation. It's your guarantee for an insulator that resists heat and make the best spark plug. Its cost is no more than others.

**"775"**

**Frenchtown Porcelain Co.  
Trenton, N. J.**

*"Established 1910—  
Busy ever since"*

**STANDS THE TEST**



## Every Sales Prospect in the Automotive Industry

The Mailing List of The Automobile Trade Directory is a complete roster of the individuals and concerns who buy and specify or authorize the purchase of practically everything that is used in the manufacture and maintenance of automotive vehicles.

The manufacturing, jobbing, retail and service fields are covered by the three sections into which this List is divided. For direct circularization, for planning the work of salesmen and for reference purposes this Mailing List is indispensable.

Send for specimen pages and details.

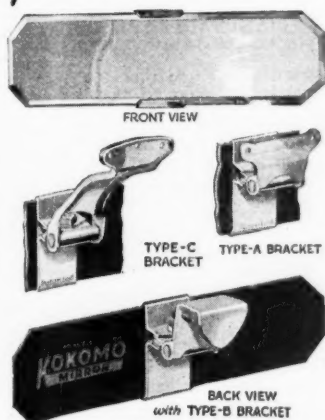
**THE AUTOMOBILE TRADE DIRECTORY**  
239 West 39th St., New York

# Kokomo PRODUCTS

## Two Things Every Motorist Wants

Kokomo Products are standard equipment on Buick, Haynes, Reo, Apperson, Durant, Earl, Winton, Mitchell, Anderson, Oldsmobile, Velie, Saxon, Briscoe and other cars.

### Safety



**Kokomo Mirrors**

Give you a clear view of the road in rear. A great convenience in traffic, in turning or in approaching a crossing. It is a safety feature as well. Made of highly polished, beautifully beveled plate glass of selected quality. The mountings are strictly high class in keeping with the finest car. Type A and C for closed cars—type B for open cars.

10 in. Kokomo Mirrors—Type A, B or C.....\$3.00  
8 in. Kokomo Mirrors—Type A, B or C.....\$2.50

### Kokomo Wings

Divert wind, rain, dust and dirt from front as well as rear seat. It is more comfortable as well as more healthful to ride behind Kokomo Wings—gives you driving comfort without shutting out the fresh air. Patented Friction device stands indefinite tightening and releasing. Easily adjusted from seat with one hand. Holds firmly against wind or vibration. Glass rides on rubber cushions—will not loosen and no danger of breakage. Fittings made from drop-forged brass, heavily nickel-plated. Cannot rust.

Kokomo Wings—per set.....\$22.50  
Hoosier Wings—per set.....18.50  
Eagle Wings—per set.....17.00

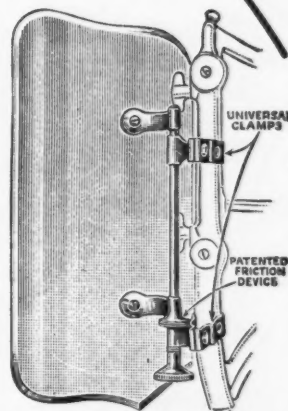
Manufactured by

**Kokomo Automotive Mfg. Co., Dept. 15-K, Kokomo, Ind.**

Sales Representatives

**The Fulton Company, Milwaukee, Wis.**

### Comfort



**KOKOMO**  
WING SYSTEM

PAT'D. JUNE 7, 1921. OTHER PAT'S. PDG.

## It Stands the Test

Another TEMCO user says our Heavy Duty Drill is "a regular hog for work." And that's what the average garage man wants. He can't pick and choose his jobs, but must tackle them as they come. That's why TEMCO dependability is a popular feature with repair men.

One of the Many Jobs  
You Can Do With

# TEMCO

Trade Mark  
Electric Drills  
(Made in five sizes)

We also make  
Electric Grinders

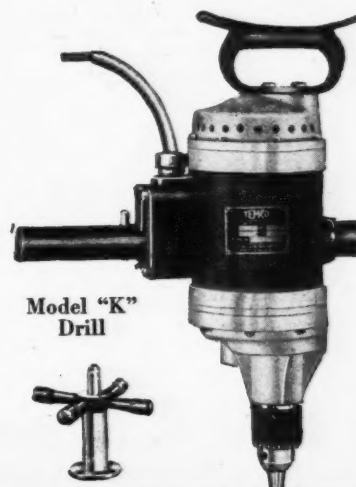
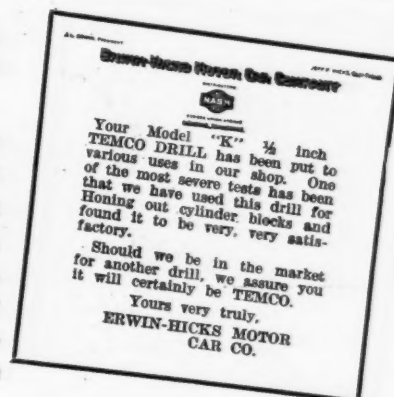
The TEMCO Model "K" Heavy Duty Drill is built for hard service, in factories, mills, garages, service stations, etc. Is equipped with TEMCO-Built, fan cooled Motor, Jacobs Chuck, Norma Ball Bearings, Screw feed, with 15 ft. cable and plug. Idle speed 600 R. P. M. Capacity, 0 to 1/2 inch in steel.

You can get TEMCO Tools of your Jobber. If not, write us giving your Jobber's name. And are you getting Tim's Talks? They're free,—and Tim is full of his subject. Ask about them.

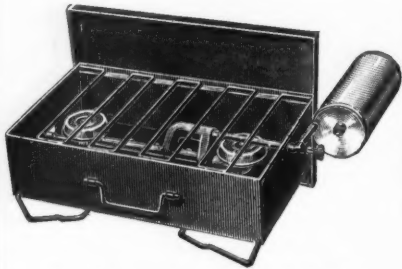
**The Temco Electric Motor Co.**

704 Sugar St.,

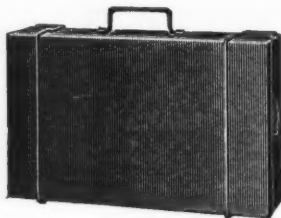
Leipsic, Ohio



## ATTENTION, DEALERS!



Two burner stove open. Both legs and grate are hinged. Lid used as windshield.



Stove closed. It's all inside. Size folded 17"x10"x4 1/4". Shipping weight 12 lbs.

The new IMPROVED "TOURIST" CAMP STOVE, is now ready for distribution to live wire dealers.

A nationally advertised tourists' and campers' necessity that sells itself wherever shown.

**PRACTICAL  
PORTABLE  
COMPACT  
COMPLETE**

The best portable cooking outfit ever designed—also of ample capacity for home or club use. Will hold two large size kettles.

Case made of heavy gauge steel—permanently finished in attractive black baked enamel.

**CAN BE RETAILED  
VERY PROFITABLY  
AT \$6.50**

The Camping and Touring season is rapidly approaching—

Write for sample and price at once!

**H. & L. EPSTEIN, INC.**

Dept. M—Wholesale Distributors

1204-06 Washington Ave.,

St. Louis, Mo.

## The National Automobile Shows Wonder Sensation UNIVERSAL AUTOMATIC SPRING OILER

Discovered and invented by Grus

Astounding and Unbelievable results

**GIVES PERMANENT  
RELIEF FROM SPRING  
SQUEAKS  
OILER ATTACHED**

The Perfect  
Leaf Spring  
Lubricating  
System

Retail Price  
Regular Sizes  
75c each

Complete Set of  
Four for FORDS  
\$2.50 per set

MANUFACTURED UNDER  
GRUS BASIC PATENTS



Just think of it, no more broken springs; no more rusted springs; no more squeaky springs; no more inactive springs; no more wasted oil.

THE UNIVERSAL AUTOMATIC SPRING OILERS make your car run smoothly, easily, quietly, comfortably, begin immediately to lay a thin film of oil between the spring leaves. Just slip the oilers over the spring directly back of the spring clip and they are there to stay—will outlast the car.

Sold at

Accessory Stores, Garages, Department and Hardware Stores. If your dealer does not handle them, order direct. It takes two oilers for each half spring—one for each quarter spring.

A Few State Distributors Wanted—Write Quick

**The Universal Spring Oiler Company**

Dept. E Medinah Bldg., Chicago, Ill.

"SEVEN FACTORIES"

Every "STOP" Light  
needs this  
Switch



Price  
**50**  
cents

—bound  
to sell fast

**Jobbers  
Dealers**

Every STOP light owner is a prospect. You will be interested in our special trade offer—and discounts.

Car owners will buy Elm City No. 50 Switches just as fast as they learn about them.

For an Elm City No. 50 will make any "STOP" signal work. It has never been known to fail. Dealers like to handle it because it is popular and sells fast.

All brass—even the spring. Water, dust and rust proof. Mechanically perfect. Absolutely guaranteed.

Get the details.

**The C. S. Mersick & Co.**

274 State Street, New Haven, Conn.



**Speed and  
Accuracy**

Many drilling jobs require both speed and accuracy. Clark Sensitive Drill is designed to meet the rigid requirements of this kind of work.

The "built-in" motor, giving direct drive, avoids unevenness and slipping so often found in belt driven drills. The friction disc assures perfect control of speed and torque, thereby saving time and the expense of broken bits.

Clark Sensitive Drills are made in two sizes—1/2" and 3/8"—both bench and floor type. Practically no installation expense is necessary, as the drills are ready as soon as electric connections are made.

The same superior material and workmanship that have made Clark Tools a by-word in production work, assure the greatest efficiency and complete satisfaction from this drill.

**CLARK  
SENSITIVE  
DRILL**

Write for catalog and complete description of CLARK BLUE RIBBON ELECTRICAL EQUIPMENT, made by the ORIGINATORS of Portable Electric Drills.

**Jas. Clark, Jr. Electric Co.**  
INCORPORATED  
Louisville Kentucky

"first in the field"





## Just Clear The Cylinder

No skilled help is required to resize cylinders with the Auto-Hone—it is so simple and effective.

It ordinarily takes about four days to completely dismantle a motor—send the bloc out for cylinder resizing—get it back and reassemble the engine.

The modern way is—connect the flexible arm of the Auto-Hone to your electric drill—slip the Auto-Hone into the cylinder—turn on the power—and in fifteen to twenty minutes the four honing stones remove the usual five to seven thousandths out-of-round—all traces of taper—ring travel—unevenness—leaving a clean, smooth, polished cylinder surface.

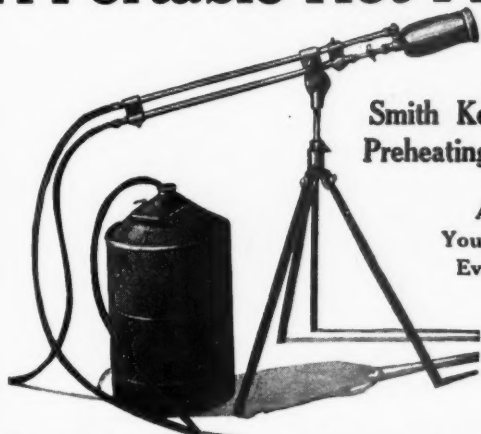
Every Garage and Service Station can make a big profit.

Put aside questions—disputes—curiosity—and get the facts. Order yours—today.

**THE AUTO-HONE CO.**  
GENERAL OFFICES 1587 MAIN STREET  
BUFFALO, N.Y., U.S.A.



## A Portable Hot Flame



Smith Kerosene  
Preheating Torch

A Tool  
You Will Use  
Every Day

For straightening frames, preheating blocks, building up new gear teeth, cutting oil and grease from fenders, around the engine, etc., straightening axles, expanding pistons, removing babbitt, spray painting, etc. Useful in a dozen ways every day in the automobile shop. Quickly portable to any part of the garage, instantly ready, no generating. Instant adjustment from a mild flame of a few inches to hottest flame of five foot length that will melt cast iron. Permanently enduring and simply made. Burns kerosene, distillate or gasoline—even drained crank case oil if desired. \$30.00 invested in this machine will earn you more money than any other equipment in your shop.

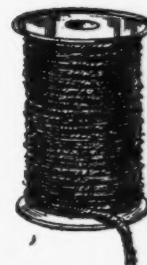
Order from your jobber today, or write us direct for special folder.

Exclusive Manufacturers of Cutting  
& Welding Equipment

**SMITH'S  
INVENTIONS  
INCORPORATED**  
Minneapolis

# PERFECTION

"A Trouble Proof  
Job That Stays Put"



## PUMP PACKING

Does its work so well that every shop should at least try it. Jobbers everywhere putting it in because re-orders practically always follow first trial.

Perfection Pump Packing is a heavily graphited long-fibre packing. No granulation. No clogging or wearing of rods. Spools as shown in all usual sizes.

Ask your jobber or write us for information and for a convenient source of supply.

**Advance Packing & Supply Co.**  
66 E. Lake Street Chicago, Ill.

Pac. Coast Distributor: Allied Industries, Inc., San Francisco, Los Angeles, Seattle

## CLARENCE A. O'BRIEN

PATENT ATTORNEY

REGISTERED IN UNITED STATES PATENT OFFICE

MEMBER OF THE BAR OF

SUPREME COURT OF UNITED STATES COURT OF APPEALS DISTRICT OF COLUMBIA

SUPREME COURT DISTRICT OF COLUMBIA UNITED STATES COURT OF CLAIMS

PRACTICE CONFINED TO PATENTS AND TRADE MARKS

EXPERIENCE

--- PATENTS ---

SERVICE

Any new article, machine, design or improvement thereof, or any new combination of parts or improvements in any known article which increases its efficiency or usefulness, may be patented if it involves invention.

IF YOU HAVE ANY NEW IDEAS which you feel are useful, practical and novel, take prompt action toward protecting your rights. If you have invented any new machine, or new combination of parts or improvements, or new process or design, SEND DRAWING, MODEL OR DESCRIPTION of it for information as to procedure to secure protection. WRITE TODAY FOR BLANK FORM "EVIDENCE OF CONCEPTION"

to be returned to me with drawing, description or model of your idea. Promptly upon receipt by me of your idea I will write you fully as to procedure and costs.

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Address \_\_\_\_\_ (Write Clearly)  
Name \_\_\_\_\_

## See that backbone!

The Atlas Radiator has a heavy steel bar across its rear face which is integral with the bracket supports and the radiator sides.

This construction, besides giving greater strength to the Radiator itself, strengthens the frame also.

But the Atlas is not only stronger—it is more efficient. Its flattened tube construction gives it three times the water capacity of the tubular type with four times the cooling surface.

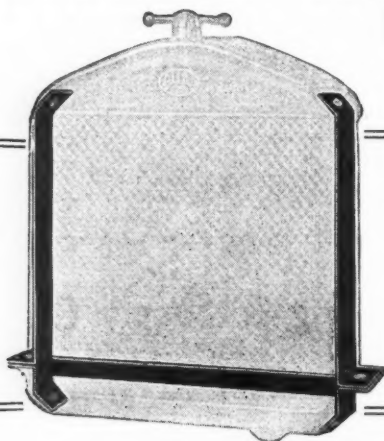
Because its brass honey-comb core is flexible and expands as the water freezes, the Atlas will not burst in winter.

And because of its increased cooling area it will not overheat in summer.

Beautifully finished—these radiators offer a wonderful replacement opportunity to dealers.

STEIDLE  
MANUFACTURING CO.  
Cincinnati Ohio

## ATLAS RADIATORS For Fords



*"The radiator  
with a back-  
bone"*

The discounts are  
right. Ask for de-  
tails today.

## Dealer in town of 8000 Sells 240 Optoshields During Christmas Season

*The*  
**Optoshield**  
TRADE MARK

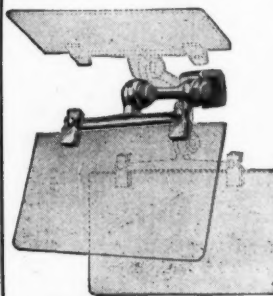
### A Big Opportunity for Dealers and Agents

All our representatives say the same thing—that the Optoshield is one of the biggest hits in years. There are many cases as good as the one mentioned above. The Optoshield has proved to be one of the most popular accessories of recent years. We are now appointing territorial distributors, dealers, local agents and representatives traveling in their own cars. All the men now handling the Optoshield are making a big clean-up. Get in and get your share.

The Optoshield relieves the driver's eyes of all strain from oncoming headlights, sun glare, road glare and snow glare. Fastens instantly to any windshield. Made of beautiful sapphire-blue scientifically made optical glass in nickel-plated bracket. Price complete is only \$3.50.


We have one of the finest propositions you ever came across—discounts are very liberal. Get in touch with us for details.

Detroit Sales Service Co.  
1647 Panobscot Bldg., Detroit



Optoshield attached. Note adjustability

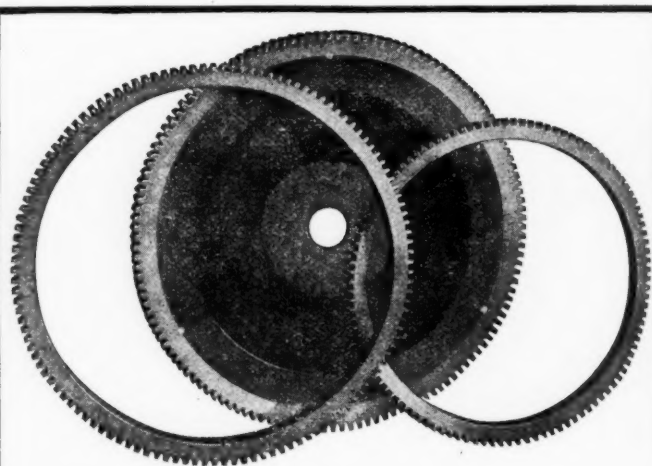




**The World's Largest  
Ball Plant**

**STEEL  
BRASS  
BRONZE  
MONEL METAL  
BELL METAL  
ALUMINUM  
AND HOLLOW BALLS**

**HOOVER STEEL BALL CO.**  
ANN ARBOR, MICH.



## Save Your Fly Wheels

When a tooth breaks in your starter gear why buy a new fly wheel. Simply turn off the gear teeth and fit on a Meachem Steel Ring Gear. It is much cheaper and will outlast the car. Ten thousand in stock.

**THE MEACHEM GEAR CORP'N.**  
Syracuse, N. Y.





## Special Garage Lathes

All engine lathes are not suitable for garage and repair-shop work. Some are too complicated and high priced—others can't stand up to the kind of work a busy repair-shop has to do. Select a Carroll-Jamieson Garage Lathe, and you get the result of 20 years of lathe building. We know what you want in a lathe and we have designed accordingly.

C. J. Lathes are the greatest value possible. 13, 15 and 16 inch swing. 5 to 12 foot lengths.

Before buying anywhere, send postal for our Bulletins and Special Price Discounts.

Carroll-Jamieson Machine Tool Co.,  
BATAVIA, OHIO

**CARROLL**  **JAMIESON**  
GARAGE LATHES

## ACCURATELY MACHINED **DALL** SEMI-STEEL REPLACEMENT PISTONS ACCURATELY MACHINED **DALL**



For replacement work after a rebore or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

### THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio

Southwestern Branch

THE CARROLL CO.

2218 S. Harwood St., Dallas, Texas

## The Ultimate Way WET INTERNAL GRINDING

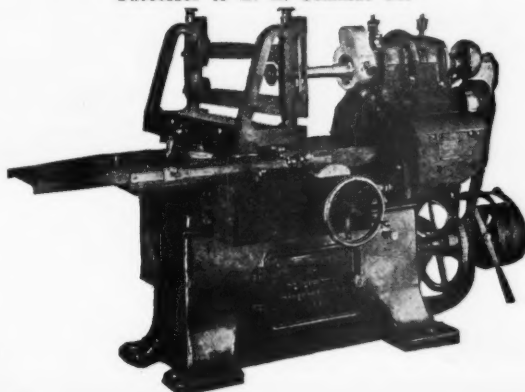
Wet grinding, as made possible by the Micro Internal Grinder is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.



The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

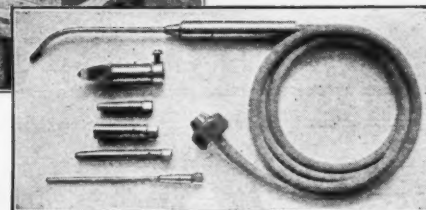
If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

**MICRO MACHINE COMPANY, Bettendorf, Iowa**  
Successor to B. L. Schmidt Co.



## Instant Soldering

### TORIT Acetylene Torch No. 13



### Ready to Use the Second You Light It

This is a wonderful torch for all kinds of soldering, brazing, pre-heating, babbitting, radiator repairing, splicing wires, etc. It is a time saver and enables you to quickly do a range of work that a soldering copper alone cannot do. Garages cannot afford to be without the Torit Ought No. 13.

#### Uses Acetylene Only

A splendid use for discarded auto acetylene tanks. Many owners make the Torit No. 13 pay for itself in a single day. Torch with 4 different tips, soldering copper, 5 ft. tubing and connection for auto acetylene tank. **\$7.50**

Order from your jobber or

**St. Paul Welding & Manufacturing Co.**

169 W. Third St.,

St. Paul, Minn.



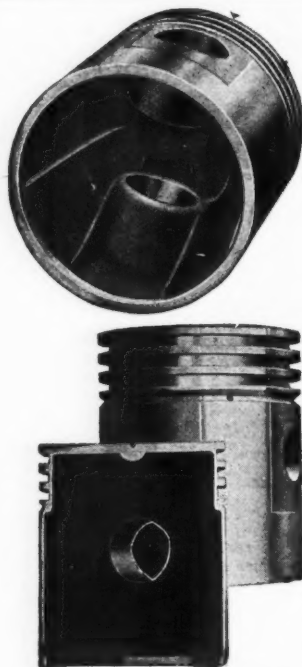
**HAVE THEM  
ON HAND  
A SERVICE  
STOCK  
of**

**FOSTER**  
sensible lightweight  
PISTONS

**ALWAYS BRINGS  
NEW CUSTOMERS**

**We Can  
Make Prompt  
Shipment of Pistons for Almost Any  
Make of Car, Truck and Tractor.  
Our Proposition Is Liberal.**

**FOSTER-JOHNSON REAMER CO.**  
1050 Beardsley Ave., ELKHART, IND.



## Are You Making Money?

If you aren't making enough out of the battery business, that is all the more reason why you should handle the Dragon. Dragon dealers are building up a great reputation for themselves and making real money at the same time.

Write and let us state our proposition.

**Englert Manufacturing Co.**  
Pittsburgh, Pa.

**Dragon Storage  
Battery**

## JOHNSON No. 7 Hand Torch



**Requires No Forced Air Blast**

The most efficient Torch for any pre-heating, soldering or repair work.

Fitted with one Powerful Johnson Burner with shut-off valve and pilot light.

Will produce a flame temperature of 2250 deg. Fahr. Is light, weighs 1 1/4 lbs., and only consumes 10 cu. ft. of gas per hour.

Write for descriptive circular of Gas Appliances.



**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids IOWA



## Re-Babbitted Bearing Exchange

We Re-babbitt any Automobile, Truck or Tractor Connecting Rod or Main Bearing with HIGHEST GRADE NICKEL BABBITT and finish them regular Factory sizes. All work guaranteed satisfactory or money refunded in full and transportation paid both ways. All RUSH Orders shipped same day order arrives.

We shipped over 100,000 Bearings last year. Over 5000 satisfied Dealers and Garages will recommend us. Save one-third to one-half your Bearings costs by sending us your work. Ship Parcels Post or Freight. We sell wholesale only.

**Fremont Foundry & Bearing Works**  
Oklahoma City—U. S. A.

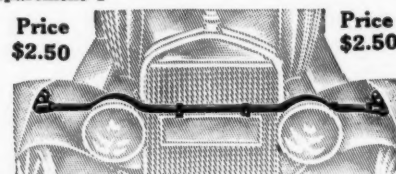
## BRACE YOUR FORD FENDERS

**APG** Fender Braces Make  
Fords Last Longer

A R G rear and front fender braces hold your fenders rigid and firmly in place and prevent rattling. Also keep fenders from sagging and cutting the tires.

A R G braces are made of selected steel—highest grade—enamelled, and are very handsome. Easy to install, long wearing. Price \$2.50. Ask your dealer. DEALERS—Write for liberal discounts.

**A R G Auxiliary Spring Company**  
Department 4 Birmingham, Ala.



**SUPERIOR  
BRACES  
For  
REAR  
And  
FRONT  
FORD  
CARS**



The Bearings Company of America, Lancaster, Penna. Angular Contact Thrust Bearings. Angular Contact Radial Bearings. Manufacturers of Thrust Ball Bearings of all types. Let our Engineers help to solve your Bearing problems.

**The Bearings Company of America,**  
Lancaster, Penna.

Detroit, Mich., Office,  
1012 Ford Bldg.



## PARKER VISES

**Have Swivels that  
Grip Like a Grizzly**

Not a mere clamping device, but a wedge and ring construction that gives a gripping power 360 degrees of the base.

Send for Parker Feature Folder No. 9

**The Charles Parker Co.,**  
Master Vise Makers  
Meriden, Conn., U. S. A.



# TASGON

has a thousand rust-dissolving duties in any shop

With a can of TASGON in his private garage, a motorist can keep his engine and valves forever free of carbon and its annoying influences.

He can feed TASGON to his springs—it works between the leaves, removing rust if it's there or preventing its accumulation, if not.

He doesn't have to bark his knuckles, or lose time and patience fuming over a "frozen" bolt or nut, for a few drops of TASGON will quickly penetrate the affected thread surface, lubricate it—and free the part.



Likewise "frozen" door hinges or locks, rust-marred nickel or metal surfaces are immediately rid of this offending substance.

Write for the unusually interesting details of the rust and carbon-melting material.

**POLYGON PRODUCTS COMPANY**  
141 Milk Street Boston, Mass.



Dealers and Jobbers will find it well worth while to learn the details of our trade offer—and send for discounts, counter displays, sales helps, etc.

**TASGON** — The Magic Fluid That Dissolves Rust

## Nothing Is Tight To This "Crowfoot" Model



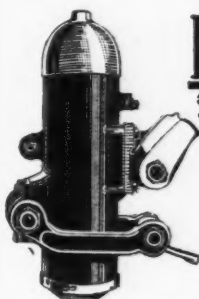
Latest design in a family of wheel pullers. A two-arm or three-arm model as you require—a UNIVERSAL Wheel Puller.

Arms drop forged from high carbon steel, screw case hardened with inserted hardened tool-steel point. Guaranteed against defects.

Made in 4 sizes. Other models, too. Equipped with LOCKING Arms.

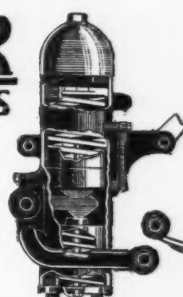
Our 24-page folder tells all there is to know about pulling tools.

**CRANE PULLER CO.**  
ARLINGTON, MASS.



Front absorber, showing attachment at shackle.

## LOMAR SHOCK ABSORBERS



Rear absorber phantom showing two springs and roller cam with arm.

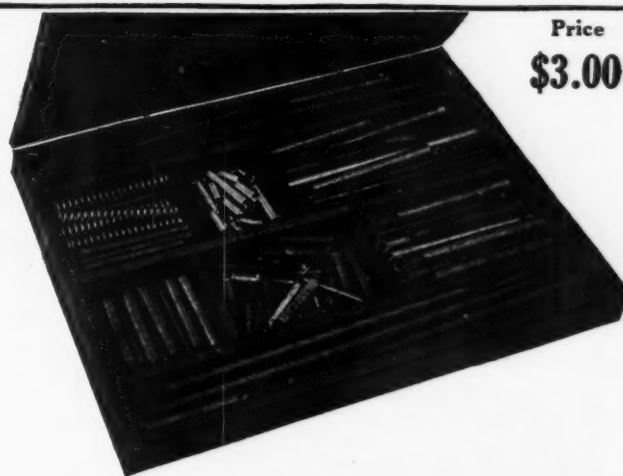
### A Regular "He-Man" Absorber

It positively counteracts every possible ripple on the road—removing altogether any jar or bump—no matter how large or deep the obstruction may be.

May we send you our booklet?

The  
**LOMAR**  
Manufacturing Co.  
Middletown, Ohio

## Springs For All Purposes



Price  
**\$3.00**

Peck's Assortment of coil springs contains about everything needed in the busy Garage, Service Station and Repair Shop in the shape of springs.

It is also a ready seller over the Accessory counter. The car owner finds it to be just what he wants and needs. Always ready—no stopping to

make—no waiting—just reach into the box and pick out what you want.

Peck's Assortment of Coil Springs comes to you in a well built wooden box, partitioned off into convenient spaces. Handy, efficient, good. Order your box today. Jobbers—write us for prices and discounts.

**THE PECK SPRING CO.**  
PLAINVILLE CONN.



## PARANITE CABLE

### Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



**FOR 33 YEARS THE STANDARD**  
**IF IT'S PARANITE IT'S RIGHT**  
 Quality jobbers handle quality cable—that's **PARANITE**.

**Indiana Rubber & Insulated Wire Co.**

210 S. Desplaines St., Chicago  
 Factory and General Offices—Jonesboro, Ind.

Ask  
 Your  
 Jobber

Write for literature

**Watervliet Tool Co., Inc.,**  
 Albany, N. Y.

New York San Francisco  
 17-21 W. 60th St. 661-665 Turk St.

## WATERVLIET SPIRAL EXPANSION REAMERS

Assure perfect fitting piston pins. **WILL NOT**  
 Chatter.



## R & V Knight

**SIX**

"EVERLASTING PERFORMANCE"

Engine Sealed and Guaranteed for 2 Years

**R & V MOTOR COMPANY**

East Moline, Ill.

## TURNER QUALITY GUARANTEED

Axle Shafts  
 Propeller Shafts  
 Pinion Shafts  
 Pump Shafts

Spring Shackle Bolts  
 Piston Pins  
 Fan Bolts  
 Spindle Bolts

*Buick Valve Lift Assembly with Guide*  
*for Passenger Cars and Trucks Sold Thru The Jobbers*

**The Turner Machine & Mfg. Co., Kansas City, Mo.**

## PROFITABLE BATTERY PLATES

GENERAL plates last so long that even your hardest customer will admit he has had his money's worth. When the customer comes back he is ready to spend more money with you. He is satisfied.

Don't you believe that these business-building plates are most profitable for you?

*Our introductory offer and our 90-day plan will interest you. Write for it.*

**GENERAL STORAGE BATTERY CO.**  
 2005 Locust Street, St. Louis, Mo.

## PETERS Crank Shaft Grinder

(Patented)

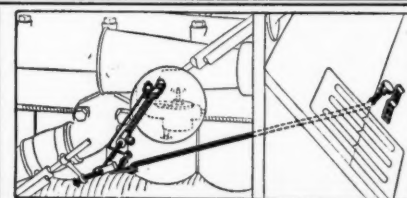
**PRICE \$75.00**

does perfect job without taking motor down. Rebabbitting unnecessary. Fits all sizes of crankshafts. No skill required. Send for circulars on this, also Peters Universal Bearing Reamer, Connecting Rod Bearing Reamer, Metallic Filler, Aluminum Brazing Solder.

**PETERS ENGINEERING CO.**

33rd Street and Woodland Ave.

Phila., Pa.



**THE GREEN LINE  
 FOOT ACCELERATOR**  
 Quickly installed, no bolts to remove. Action is easy and positive. Works free from hand throttle. Floor boards can be removed without disturbing Accelerator.  
 Write for full particulars.  
 Price .....\$1.25  
**Green Manufacturing Co.**  
 506 Second St., Milwaukee, Wis.



**MECHANICS PREFER "RUBY FLUID"**  
**BECAUSE IT IS**

**NON-POISONOUS  
 NON-EXPLOSIVE  
 NON-CORROSIVE**

A Safe Soldering Flux  
 FOR ALL METALS

Write Today for Liberal Sample and Dealer Discount.

**The Ruby Chemical Co.**  
 68-70 McDowell St., Columbus, Ohio

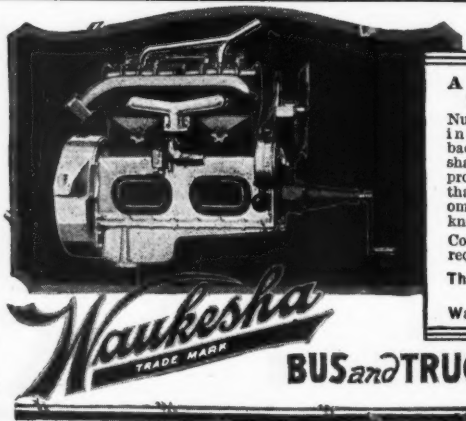


## IT'S EASY TO SELL

"The only oil ring with a mileage guarantee"

"Sav-Oil" is stamped on bottom of every ring

**The Sav-Oil Ring Mfg. Co.**  
 1037 S. Figueroa St., Los Angeles



### A New Bus and Truck Motor

Numerous engineering refinements backed by Waukesha experience have produced a motor that develops economies heretofore unknown.

Complete details on request.

**The Waukesha Motor Company**  
 Waukesha, Wisconsin

**Waukesha**  
 TRADE MARK  
**BUS and TRUCK MOTORS**

## ARE YOU LOOKING FOR A REAL BARGAIN?

Watch the classified advertising columns of **MOTOR AGE** and you'll see many of them. Often a man has goods for quick disposal and he announces the fact here. Whether or not you are in the market right now for certain things you will find it pays to look over the classified ads every time you receive your copy of the paper. It's a good habit to get into and some day you'll be mighty glad of it.

*Get the Habit—*

**READ THE CLASSIFIED ADS IN MOTOR AGE**



## REID AIR SPRINGS

FLOAT THE CAR ON AIR  
 Most highly developed but lowest priced Air Spring. No side sway or tipping at turns.

Can be installed by dealer who sells them. Big opportunity for distributors and dealers—sales are easy—discounts long. Write.

**THE REID AIR SPRING CO.**  
 New Haven Conn.

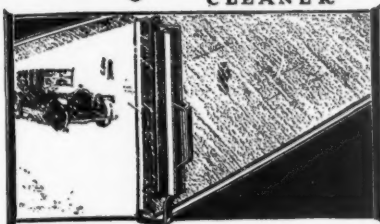


## BOTH sides of windshield cleaned instantly—

SELLS  
ON  
SIGHT

The Jiffy

WINDSHIELD  
CLEANER



It is criminally careless to drive with a fog or mist laden windshield. And BOTH sides of the glass must be kept clean. Jiffy is popular with motorists because it cleans BOTH sides with one sweep across the windshield. Dealers like to handle it because it sells fast. Attractive — sturdy — efficient. Positively will not rattle. Write for interesting trade offer.

The LaViertes Mfg. Co., New Haven, Conn.



## Pacific Reground Bearings FOR QUALITY and SERVICE

Large Stock Pacific Reground Bearings on hand for immediate exchange.

Special Bearings Made to Order

NEW BALL BEARINGS FOR ALL PURPOSES  
Western Distributors Bower Roller Bearings

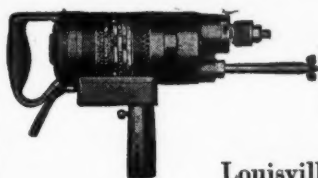
## Pacific Ball Bearing Co.

415 WEST PICO STREET

Los Angeles

California

## Get This "Pioneer" Garage Special



Electric Drill  
and Valve Grinder

Greatest time and money saver,  
as well as money maker, for  
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.

Incorporated Louisville, Ky., U. S. A.  
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

## MR. RADIATOR REPAIRMAN



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Each successive blade  
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TWICE the expansion of others. All  
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REAMER—Wonderful Time-saver.

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### How to Eliminate Piston Slap

Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners. But it can now be eliminated. With the E. C. L. Aluminum Alloy Non-Expanding Piston. E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oil — increase power and speed and eliminate spark knocks. Let us tell you more about this remarkable piston. Write for the details today.

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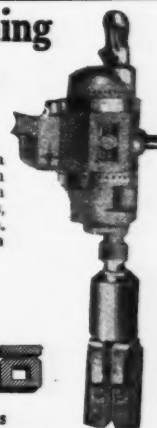
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Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.  
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Put Silence into your repair jobs. For "Silence is Golden." And Silence is another name for Cloyes gears. Made of Formica—accurately cut—Cloyes Gears give your patrons a permanently quiet motor. We sell direct to the dealer—and give him all the discounts.  
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**Oversizes Standards Specials**  
Prompt shipment, highest grade materials, precision accuracy to closest dimensions and unexcelled workmanship. Send for specification and price lists—they make pin and valve buying simple.  
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**CYLINDER HONES**  
Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



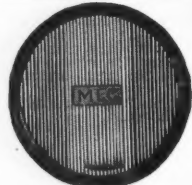
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Indicates definitely direction driver intends to turn. Signals at both front and rear of open or closed cars. Meets requirements of all State laws. Attractive—Durable—Effective. Dealers - Jobbers, write for details and territory.  
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Standard Equipment on 30 of America's Foremost Cars  
Write for Prices.  
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OVER 50 WONDERFUL SHORT CUTS IN NEW CATALOG T-105  
ASK FOR IT  
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Kokomo Long Life tires and tubes make money for dealers who handle them.  
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Won't Leak Because They're Sealed With Oil  
**"NO-LEAK-O"**  
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100% Service. Whole surface of Shoe grips the Drum. Complete contact. Four times the brake power.

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Sales Representatives

Pressure Proof Piston Ring Co.  
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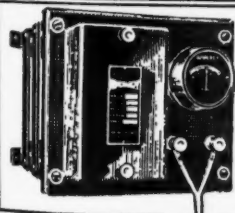
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A good profit for you in this wonderful, fast-selling necessity.

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Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, prevent spark plug fouling and reduce carbon formation.

Write for interesting circular on oil pumping and details about this fast selling piston ring.

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## PERFECTION Silent Timing GEARS

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DURABLE  
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WORLD'S  
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Warms any car, open or closed. No odor, smoke, dust or noise. Easily installed, operated and cleaned. Sells quickly. Write for our attractive trade proposition.

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Insure perfect timing

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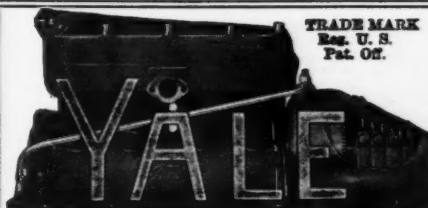


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\$6.50

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 Nine body types,  
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 A ring for every purpose—Spiral Cut, Olless and StepSet—and a complete line of semi-steel Replacement Pistons and high-grade Piston Pins. Write for details.  
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 6 TO 12 CARBURETORS IN ONE action.  
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 Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.  
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 Attached or removed without tools, no installation cost, no time wasted, sale is complete over the counter. DOES A \$10 JOB FOR \$5.  
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 Seals both the cylinder wall and the piston groove—the double sealing feature that has made this ring famous. Write for our dealer proposition—it's a mighty good one.  
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**PRODUCTION**  
  
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 ALL THE NAME IMPLIES  
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**Shorts**

**Disks fit all plugs—25 times more spark gap. Price 4 for \$1.00**

Return them and get your money if they foul, or do not improve the power, ignition and starting. Our Thermostatic carburetors atomize, gasify and mix the proper amount of fuel with ALL the air taken into the motor. More miles per gallon, and less motor heat guaranteed. Liberal proposition to dealers.

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*Does a better job in half the time.*

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There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.



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**SELF-ALIGNING BURNISHING MACHINE**

Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

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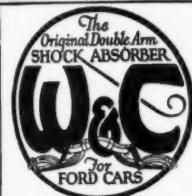
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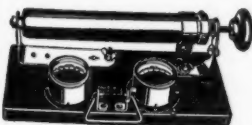
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Auxiliary firing-chamber gives it the explosive power of a howitzer. Carburetor must be adjusted LEANER immediately. Overcomes oil, self-cleaning.

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*With the Explosive Spark*

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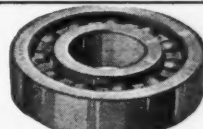
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Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

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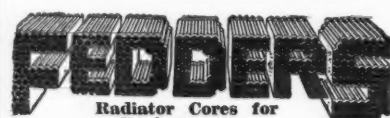
and Chevrolets. A thrust bearing for the differential. Makes 'em push easier, climb better, dodge axle trouble.

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Let your customers hear the  
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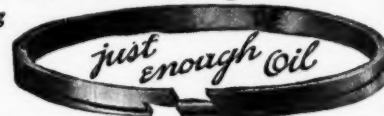
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With the Wandering  
Oil Groove

[pronounced  
WICK-A-CO]

WICACO

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Theft proof. Write today.  
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Hudson and Essex Dealers are  
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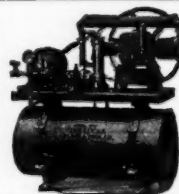
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**Inshield**  
SPOT & SERVICE  
LIGHT COMBINED

FITS ALL CARS  
OPEN & CLOSED

The Light that  
Means Most to  
The Motorist

MADE IN TWO SIZES  
ASK YOUR JOBBER  
MFG. BY THAL & BITTER MCH. CO. TOLEDO, O.



**DAYTON AIR COMPRESSORS**

Automatic Control. Automatic Release.  
Start against no load.

Style E-2: 2 3/4 cu. ft. per minute.  
140 lb. pressure. Tank 16x36, 32 gallon.  
25 ft. hose with air chuck. 1/2 H. P. Motor.

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Plastic Metallic Packing

Patented  
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"Once an Owner, Always a Friend"

The complete Auburn line of 1923 including the Smaller Six pro-  
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ESTABLISHED 1885

ACCURATE MEASURING PUMPS

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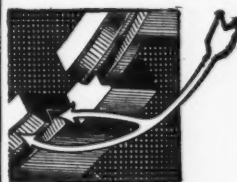




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Pilot may be expanded to fit the valve-stem hole regardless of wear. Cuts valve seat CONCENTRIC with hole. No chatter-marks. Full set in oak case \$12.00. Circular.

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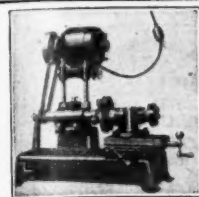


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Forced Lubrication Prevents Foul Plugs. The beveled top edge and central groove keeps oil from the combustion chamber—reduces carbon. Dealers—Write for the details.

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No Chatter Marks, Vibration or End Play  
TEN DAYS FREE TRIAL

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WE MANUFACTURE replacements for all makes of cars and sell to jobbers all over the world.

BUTLER AUTOMOTIVE STEEL CO.

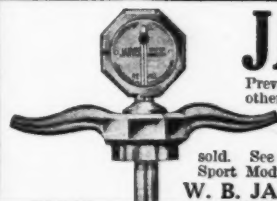
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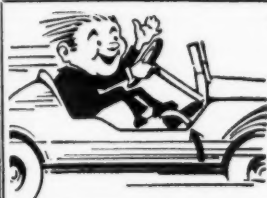


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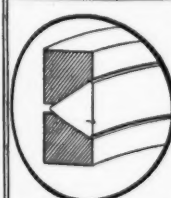


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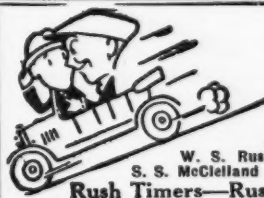
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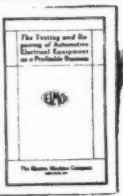
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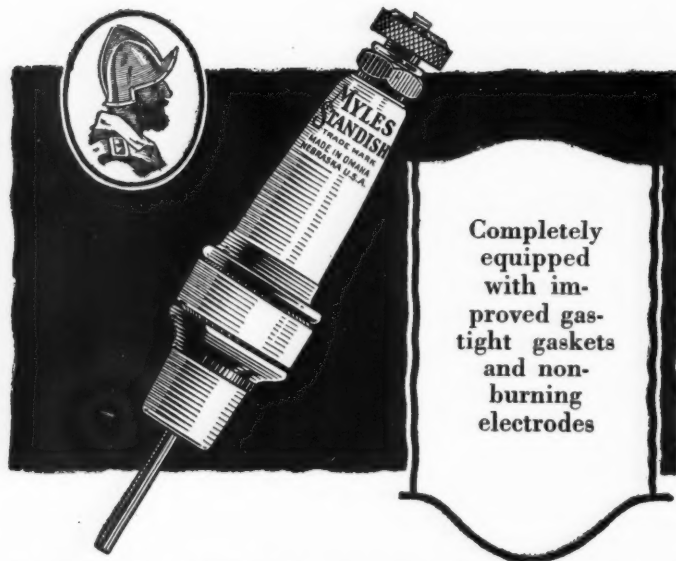
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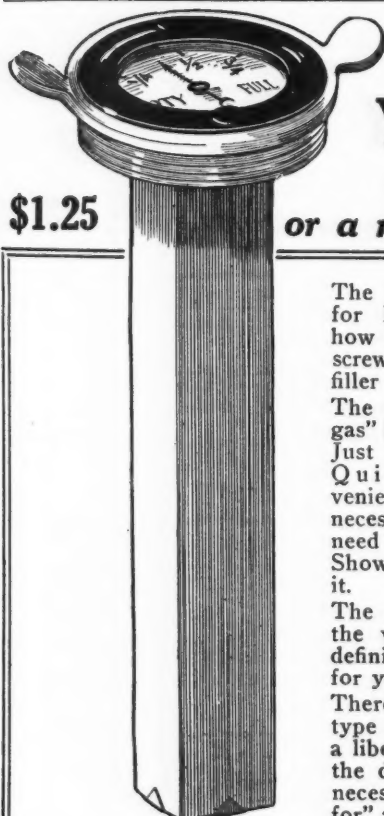
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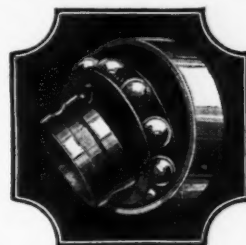
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*Finer Motor Cars*  *At Lower Prices*

Send for full-color catalogue and contract terms to dealers today

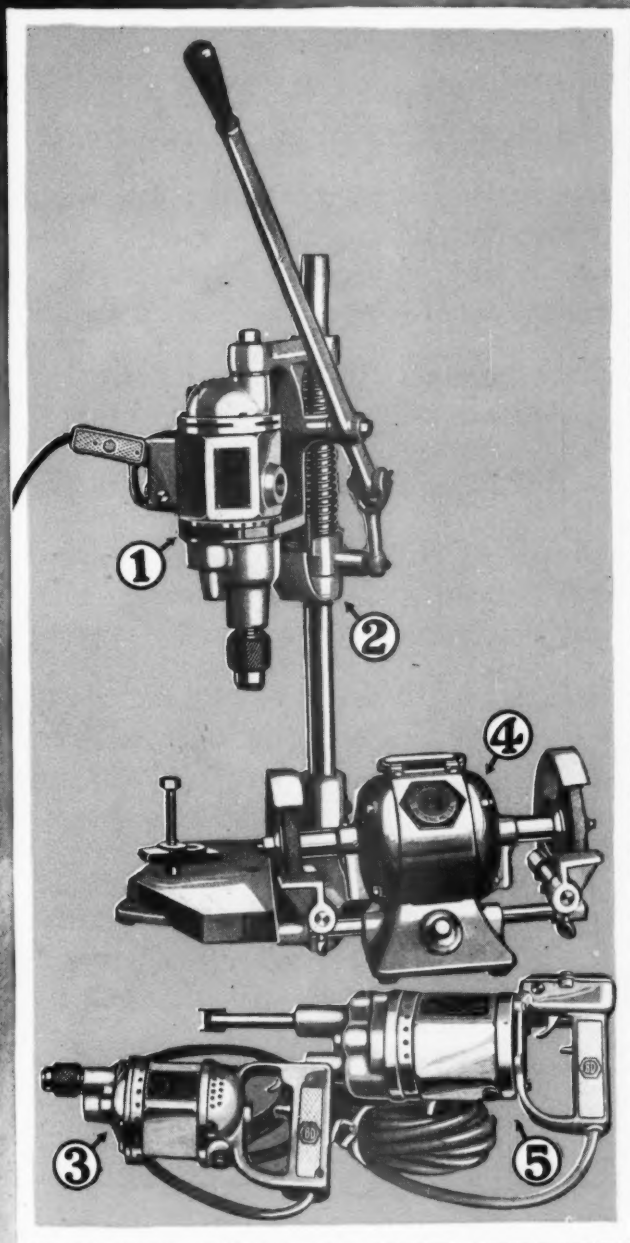
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# \$ 207 <sup>00</sup>

More than a thousand jobs can be done with these five tools.



### BLACK & DECKER

- |   |  |      |
|---|--|------|
| ① | Half-Inch Special<br>Portable Electric Drill                     | \$68 |
| ② | Bench Drill Stand<br>(Makes a Drill Press of the Portable Drill) | \$28 |
| ③ | Quarter-Inch Portable<br>Electric Drill                          | \$28 |
| ④ | Six-Inch Electric<br>Bench Grinder                               | \$38 |
| ⑤ | Electric Valve Grinder   | \$45 |

ONLY **\$207**

What other five items of shop equipment can you get for only \$207 which will be as useful and make as much profit for you.

**YOUR JOBBER HAS THEM**



**THE BLACK & DECKER MFG. CO.**

Towson Heights, :: Baltimore, Md., U. S. A.

Branch offices and service stations  
carrying complete stocks of parts  
and operated by factory trained  
men located in

Boston  
New York  
Atlanta

San Francisco  
Philadelphia  
Kansas City

Detroit  
Chicago  
Cleveland

Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.



The Best-Equipped Shop  
Gets the Business

BACKGROUND PATENT PENDING  
BLACK & DECKER MFG. CO.



# *A New Dealer Contract* *that insures* **PERMANENCE OF BUSINESS**

DEALER'S COPY

THIS AGREEMENT made this \_\_\_\_\_, 19\_\_\_\_, between \_\_\_\_\_ and \_\_\_\_\_, hereinafter called the Distributer, and \_\_\_\_\_

With \_\_\_\_\_

THE DISTRIBUTOR

ONE: That he hereby grants to the Dealer the right to sell new Chandler automobiles from the \_\_\_\_\_ of this contract, in the following described territory \_\_\_\_\_

That beginning with the \_\_\_\_\_ the Distributer will not knowingly sell \_\_\_\_\_ except as hereinafter provided. He \_\_\_\_\_ expressly authorized by him so to do. \_\_\_\_\_ cars to residents of said territory for \_\_\_\_\_ or merchandise purchased or contracted for \_\_\_\_\_

TWO: To deliver to or cause to be delivered to the Dealer at place of shipment or delivery, in \_\_\_\_\_ after agreed upon in writing between \_\_\_\_\_ such models as the Distributer may \_\_\_\_\_ then at such changed net prices as \_\_\_\_\_ to cover all taxes, duties and charges \_\_\_\_\_ assessed by the United States Government, the Dealer hereby agreeing \_\_\_\_\_ have been agreed on submit to \_\_\_\_\_ him monthly during the next \_\_\_\_\_ to the Distributer for delivery \_\_\_\_\_ be for at least \_\_\_\_\_

Five-Pass. Touring Car \_\_\_\_\_ \$ \_\_\_\_\_

Sedan, \$ \_\_\_\_\_

Limousine, \$ \_\_\_\_\_

(NOTE.—The Chandler cars of January 2, 1923, are \_\_\_\_\_)

Two-Pass. Roadster \_\_\_\_\_ \$ \_\_\_\_\_

Pass. Sedan, \$ \_\_\_\_\_

SCHEDULE \_\_\_\_\_

Company shall \_\_\_\_\_

**I**NVOLVED with the Chandler proposition is a most appealing dealer contract.

By virtue of one feature alone, the new contract merits the most thoughtful consideration by every dealer who is interested in establishing a *permanent business*.

That feature is: the new Chandler contract contains

## **No Termination Date**

As a result of this departure from the customary practice, Chandler dealers can plan their business over a span of years.

In its other phases, too, the new Chandler dealer contract is designed to appeal to merchants now engaged in, or who may enter the automobile business.

And you can make no mistake by investigating the possibilities of your becoming a Chandler dealer. In open territory, quick action will bring gratifying results.

**THE CHANDLER MOTOR CAR COMPANY  
CLEVELAND**

Export Dept., 1819 Broadway, New York  
Cable Address, "Chanmotor"

# **NEW CHANDLER SIX**